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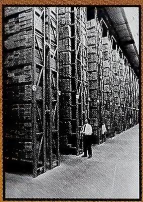
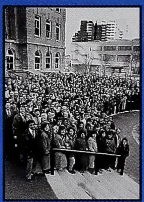
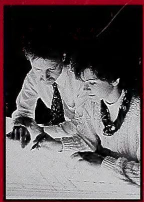
ENERGY ALBERTA 1992

A REVIEW OF ALBERTA ENERGY RESOURCES IN 1992



Energy Resources Conservation Board

This year's *Energy Alberta* features a special supplement entitled *Time of Transition: the Energy Resources Conservation Board into the Next Century*. It explains how the organization is responding to change while continuing to serve the interests of all Albertans.

ERCB MISSION

To ensure that development of Alberta's energy resources takes place in a responsible manner in the interests of Albertans.

CANADIANA
JUL 21 1993

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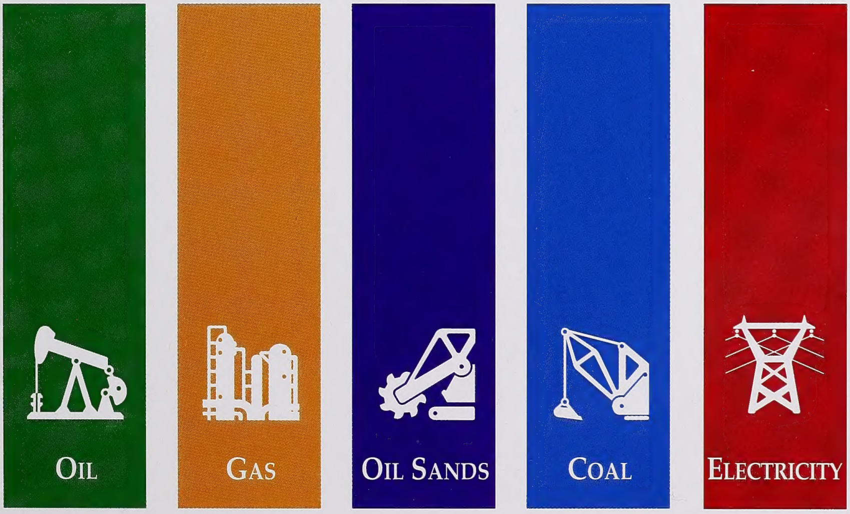


Each colour bar above relates to a specific energy resource. The same colours are used for graphs in the publication.

ERCB VICE CHAIRMEN MR. FRANK MINK (*L*) AND DR. PHIL PRINCE.

Vice Chairmen's Message

ADAPTING TO NEW REALITIES

On behalf of the Board Members, managers and employees of the ERCB, we are pleased to present *Energy Alberta 1992*.

1992 was marked by hard work, difficult choices and gratifying achievements at the ERCB. Our workload continued to expand while we coped with budget constraints. Accomplishments included the ERCB's major report on the *Ultimate Potential and Supply of Natural Gas in Alberta*, the Call for Information on the Pacific Gas Transmission/Altamont pipeline proposals, and the review of the operation of the NOVA pipeline system.

One question we heard this past year was, "If Alberta's energy sector—especially the oilpatch—is downsizing, shouldn't ERCB activity have a similar trend?"

First and foremost, the ERCB **is** downsizing. Since the mid-80s, when we had 820 employees, our staff complement has declined 20 per cent. With 70 per cent of our budget invested in people, this reduction has been a major accomplishment.

We also embarked on a quality management and service program in 1991. Our aim is to systematically improve the efficiency and effectiveness of every ERCB function. We now ask fundamental questions such as, "Is there a better way to do a particular task? Should we be doing it at all?" This mind-set is already reaping rewards in terms of streamlined application and inspection processes.

Our aim is to systematically improve the efficiency and effectiveness of every ERCB function.

What we do internally is only part of the picture. A recent surge in the number of small oil and gas companies has been accompanied by a lack of regulatory expertise by some operators. ERCB people today are providing more guidance than ever to such companies to ensure they fulfill regulatory requirements.

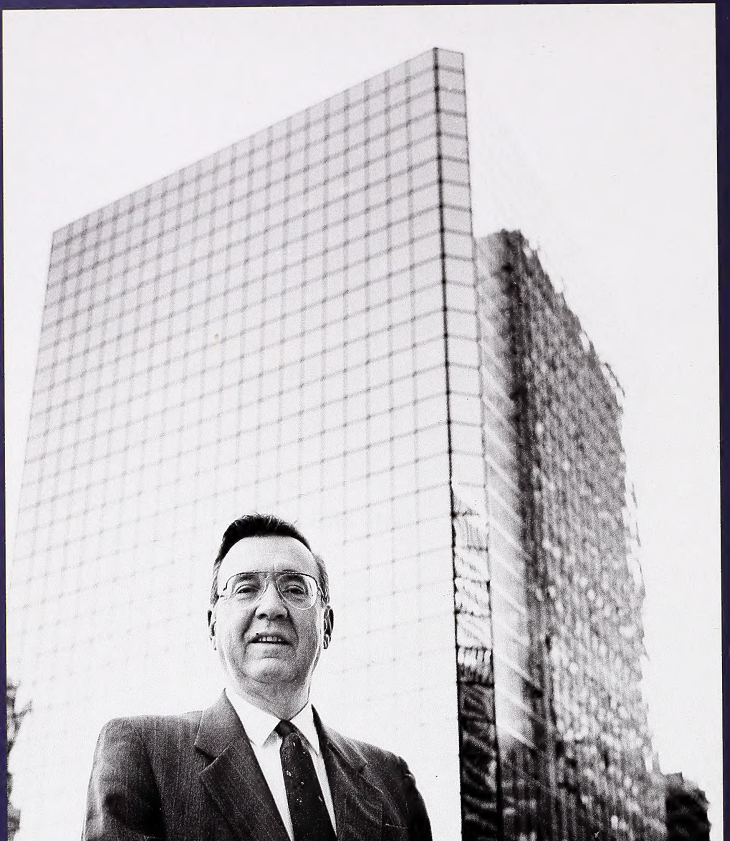
We are also beginning to grapple with the decommissioning of thousands of energy facilities. Over time, the magnitude of this work will be similar to—if not greater than—licensing new facilities.

Added to this is a recent upswing in industry activity in response to better gas prices, oil-price stability worldwide, and new royalty policies here at home. In addition, our work in regulating coal, oil sands and electric energy marches forward at a steady pace.

The downsizing story does not include Alberta's growing industry infrastructure—all those suspended, aging and changing energy facilities. What this means for the ERCB is a compelling need to dedicate more effort to monitoring and inspecting sites. This is not only our imperative but the public's, too. The ERCB plays a large role in protecting the safety and environment of Albertans. That role is here to stay, as is the need for public involvement at each step of energy development.

On the surface, then, the answer to the original question is straightforward. The ERCB is getting smaller. We are adapting to rapidly changing industry circumstances and public expectations while maintaining the excellent work for which we are known. ■

J.P. Prince



GERRY DeSORCY RETIRES AFTER 38 YEARS IN PUBLIC SERVICE.

TRIBUTE

GERRY DESORCY

On 12 February 1993, ERCB Chairman Gerry DeSorcy retired after 38 years of public service. On 27 October 1992, Mr. DeSorcy received the Lieutenant Governor's Award for Excellence in Public Administration in Alberta. To provide insight into Mr. DeSorcy's career, here are excerpts from Vice Chairman Dr. Phil Prince's speech that evening.

"Mr. DeSorcy began with the Board at our Drayton Valley office in 1955 and worked at Stettler before coming to Calgary head office. One accomplishment early in his career illustrates his approach to whatever he takes on.

"There was a need for a technical manual on gas well back pressure testing, but it was a big job. Eventually, the Board's Chairman at the time, Dr. George Govier, decided to assign it full time to a young engineer named DeSorcy. Well, he got the job done. But it was not only what might have been expected—a good, useful manual for field people—it turned out to be a treatment of the subject that soon became the standard in its field, adopted as a textbook at most major universities in North America.

"Since then, he has made numerous and diverse contributions to the Board, ranging from introducing the Board to its first mainframe computer, to convincing industry to assist in developing an energy-resources data system that has received worldwide attention.

"Gerry's commitment to his profession has been demonstrated in a variety of ways, most notably his work over the years with the Association of Professional Engineers, Geologists and Geophysicists of Alberta. In 1989 he was the recipient of the L.C. Charlesworth Award for service to the engineering profession.

"Although the ERCB has been the major focus of Gerry's career, in 1989 he was chosen to chair the difficult and sensitive federal/provincial environmental review panel on the Alberta Pacific pulp mill in northern Alberta. And in 1991, after a long search to find a Chairman for the Natural Resources Conservation Board, the Government could find no match for Mr. DeSorcy to take on that important assignment.

"The American mathematician, James V. Cunningham, defined professionalism as doing the job for the job's sake. A simple concept but, I suspect, rare in practice. There are not many among us who can honestly say they do the job for its own sake. But Gerry DeSorcy is one who can—a true professional.

"Everyone who has known Gerry well for many years simply expects him always to be prepared, always to have thought about difficult issues, always to bring coherence from confusion, and organization from chaos, and through it all to exhibit a generosity of spirit and an inherent fairness that is truly remarkable.

He simply does what needs to be done—he does the job for the job's sake—he is a true professional." ■

"Doing the job for the job's sake."

(l-r) Former Board Member, Emile Morin, recently-retired ERCB Chairman, Gerry DeSorcy, and John Curran of Calgary's Bennett Jones Verchere in Moscow as part of a project that could transfer Alberta's regulatory expertise to the former Soviet Union.

EXCELLENCE

ERCB vision encompasses:

- **values that embody our commitment to fairness, honesty, equal opportunity, quality and excellence in all our undertakings, and respect for the dignity and rights of people.**

Feature Article

ALBERTA AND PETROLEUM SECTOR PRIVATIZATION IN THE FORMER SOVIET UNION

A "black gold rush". That is how some described international interest in Russia's petroleum industry in 1992. During the year, hundreds of Albertans caught the fever and began making their mark in the petroleum sector of the former Soviet Union.

Explaining the burgeoning interest in the new Russia by Canada's oilpatch involved a diverse set of political, economic and social factors. Topping the list were the sweeping political and cultural changes of the past two years that opened this vast area to private investment.

A major impediment to privatization in the new Russia, however, is a petroleum industry in virtual collapse. Oil exports from the region have fallen by more than 50 per cent from 1988 highs. Output is hampered by aging equipment, dated technology, lack of parts and the absence of a regulatory infrastructure. Given this scenario, western interests, both public and private, have come to view the region as a field of opportunity.

Another reason for private petroleum development in the new Russia coincides with a downturn in opportunities in Canada for major oil and gas companies. In the past five years, Canada's upstream petroleum industry has undergone fundamental changes. No longer a growing industry, it is a mature, less active one.

The initial successes of Canadian ventures in the new Russia reflect the technologically-advanced nature of Canada's petroleum industry. Canadians are offering their Russian counterparts practical skills, the latest technologies, as well as sophisticated safety, environmental and regulatory systems. But those closest to the action also point to another important, albeit less tangible, success factor. It is summed up as a combination of latitude and attitude: similar climates, both harsh; similar geographies, both rugged; and a sensitivity to cultural differences on the part of Canadians.

This article examines the work of Alberta's petroleum producing and service sectors in the former Soviet Union, as well as private and government initiatives to create energy resource management and regulatory systems. This feature concludes with a look at the expertise Canadians bring to the Russian petroleum industry in areas such as environmental protection and aboriginal land issues.

RUSSIA

Alberta's petroleum producers and service sector lead the way

The states that make up the former Soviet Union are the world's largest oil and gas producers. Known oil reserves are about 10 billion cubic metres and 45 trillion cubic metres of natural gas.

For many Albertans, 1992 was probably the first time they began to hear stories of friends, neighbours or colleagues working in the former Soviet Union.

Leading the way for large oil producers in the new Russia was Calgary-based Gulf Canada Resources Limited. The company first began evaluating opportunities in 1989, but it was not until December 1991 that the KomiArcticOil Joint Venture received final approvals and was "open for business". Gulf and British Gas each have a 25 per cent interest, and their Russian partners have a 50 per cent interest.

During 1992, KomiArcticOil became one of the first oil and gas joint ventures to be granted an exemption from an oil export tax.

This achievement was crucial because the joint venture sold all its 317 000 cubic metres of oil production on world markets.

The prime area of activity was the recently discovered Upper Vozey Field, where Gulf's share of production increased to about 600 cubic metres per day. The joint venture drilled and completed seven new wells and completed four existing wells, using western completion techniques. A service rig imported from western Canada in April 1992 joined four Russian rigs to complete 11 workovers. The partners installed a 40-person service camp in the field and started construction on another 100-person camp.

AS PART OF GULF CANADA RESOURCE'S JOINT VENTURE IN KOMI, THE COMPANY IMPORTED THIS SERVICE RIG AND ITS CREW FROM ALBERTA IN APRIL 1992.

One of Gulf's 1993 projects will be to have waterflood facilities to demonstrate and evaluate enhanced recovery techniques in the older Vozey Field which has been producing for more than a decade.

According to Gulf, the joint venture is a win/win deal. Western partners get an opportunity to develop existing reserves of low-cost oil. The Russian partners get capital and technology, and an increased flow of hard currency into the country.

Alberta's petroleum service industry has a similar tale to tell. In a November 1992 speech, Carmen Fairman, President of the Petroleum Services Association of Canada (PSAC) estimated that roughly one-third of its 175 members is currently exporting products and services, or operating internationally. Most are working in the former Soviet Union.

According to Fairman, the movement has been driven by necessity at home as much as by changes in global politics. Canadian companies that survived fierce domestic competition have sought export markets to diversify and grow.

In his speech, Fairman painted a word picture about the technology and advanced technical expertise Canadians have to offer their Russian counterparts.

"Canadians have been developing their petroleum resources under some of the most challenging and varied conditions on the globe. Extreme climatic conditions are most pronounced in the 'frontier' areas—the Mackenzie Delta, the Beaufort Sea and the High Arctic, as well as the East Coast offshore. In these environments, Canadian technology and innovation have battled cold, darkness, ice and the fierceness of the Atlantic Ocean.

THE RIGHT STUFF? SEALWELD AWAITS FIRST RUSSIAN CONTRACT

After six trips to Russia in two years, Calgary-based Sealweld Corporation Ltd. has worked hard to lay the groundwork for its first major contract in the former Soviet Union.

Operated by the Chisholm family—father Bill, and sons Dean and Hugh—Sealweld manufactures special greases that stop pipeline valves from leaking. The company also provides "house-calls". The Russian bid could involve a couple of crews to overhaul pipeline valves and then to transfer knowledge and expertise to local operators.

Sealweld's story is typical of the kind of approach that seems to work in the new Russia. Born in Killam, Alberta, Bill Chisholm worked in the oil patch in the 50s as a roughneck and supply store salesman. After a stint in Texas, where his interest in valves began in earnest, Bill returned to Alberta in 1964.

One of Bill's early lubricants was designed to seal valves on gas pipelines. The product proved especially useful in a province that already had a major gas distribution system. (Unlike oil pipelines, dry gas pipelines need special greases to seal valves and prevent leakage.)

According to Dean Chisholm, "we first met the Russians five years ago in Africa. Only with recent political changes are we making good on those contacts.

"Working with the Russians brings out all the things we have in common," says Dean. "We tend to talk about hockey, joke about politicians, and be good with our hands. We seem to go there with a let-me-show-you attitude, and they appreciate the respect."

The down side, the Chisholms admit, is that the risks are high. There is the frustration of delays in getting a firm answer on a contract, as well as uncertainty about when to expect payment.

Bill and Dean Chisholm are optimistic. Their attitude is that the Russians—after years of standing in line for inferior goods—deserve the kind of service Sealweld provides. The company and its people seem to demonstrate the "right stuff" that has already signalled success for other Alberta companies—a good product, good service, and a willingness to transfer expertise. And, a good sense of humour.

SEALWELD'S DEAN CHISHOLM (*SECOND FROM LEFT*) IS POISED TO OFFER HIS COMPANY'S SERVICE AND TECHNOLOGICAL KNOW-HOW TO PIPELINE OPERATORS IN THE FORMER SOVIET UNION.

"Even in the more familiar areas of western Canada, there are extreme conditions of a technical nature—unconventional oil in our oil sands and heavy oil deposits, the safe handling and exploitation of sour oil and gas, and enhanced recovery techniques for mature reservoirs.

"Geography is another unique challenge. Oil and gas in remote locations must be transported long distances over rugged and varied terrain. The conditions have necessitated the development of a large oilfield transportation system and sophisticated all-terrain service vehicles, as well as a vast network of pipelines."

Russia and the Alberta regulatory model

Based on functions of Alberta's Energy Resources Conservation Board, work is underway on the initial phase of a $10-million project to establish an energy resource database and to develop oil and gas regulations in Russia.

One liability western companies face in the new Russia is the lack of an infrastructure for managing oil and gas resources. Calgary computer consultant, Bob Bolton, a 20-year veteran of the international oil and gas business, is managing the Canadian portion of a venture to change that situation. Critical to the success of the project is a regulatory system known in the new Russia as the "Alberta Model".

Bolton explains its appeal.

"There are two ways to get oil companies to invest in a so-called risky venture. One way is to give them the security of owning the resource. Another way is to keep the resources state-owned, but to create an infrastructure with rules that are equitable, reasonable, visible and predictable. Such a system is key to state ownership in a market economy.

"The Russians are very reluctant to sell the state's resources outright to big oil companies. According to the Alberta Model, the state—and thus the people—continue to own the resource. Just as the Government of Alberta (the Crown) holds the majority of mineral rights, the province of Tyumen, for example, is looking at a system of competitive bidding for such mineral leases. This is a 'friendly' model for officials because they maintain control of the resource yet can see their way clear to work in a free enterprise economy.

"One of the keys to the success of the Alberta Model is the presence of a strong regulator such as the ERCB. The ERCB makes Alberta's system work effectively by monitoring private operators consistently and equitably, collecting data that is publicly available to all, and having a strong inspection team to ensure the resource is managed properly."

Bolton points out that adapting Alberta's regulatory model to Russia is fraught with problems—political instability, environmental degradation and uncertain authority among levels of government.

In Bolton's view, the Alberta Model works because it has a long history of dealing with a fully-integrated stream of petroleum production, a process that is largely absent in the new Russia. Making all petroleum sectors work together, most agree, will be the test of the region's ability to adapt the Alberta Model successfully.

A RUSSIAN OIL RIG. CREATING A REGULATORY FRAMEWORK FOR OIL DEVELOPMENT IS ONE OF THE ALBERTA INITIATIVES NOW UNDERWAY IN THE NEW RUSSIA.

Governments join forces to assist with regulatory framework

Preliminary estimates from Alberta Economic Development and Trade indicate that more than 30 Alberta companies have permanent operations in the former Soviet Union. Most are oil-and-gas-related joint ventures. The value of Canadian petroleum investments in active projects there stands at more than $1 billion.

In step with private industry initiatives in the new Russia in 1992 was the assistance promised by western governments to help the former Soviet Union evolve market economies.

During Russian President Boris Yeltsin's official visit to Canada early in the year, the Canadian Government offered assistance in petroleum policy and regulatory legislation. The first result of the government-to-government initiative was a September seminar in Moscow to explain Canadian approaches to managing energy resource development.

The Alberta Government's view involves using provincial expertise in oil and gas management as a "hook" for a number of cross-sectoral opportunities.

In May 1992, the Alberta Government signed a Memorandum of Understanding with the Tyumen Oblast (Province) of the Russian Federation. In that document, both jurisdictions indicated "their mutual interest in developing closer ties both at the government and enterprise level" on a variety of fronts.

Heading the list was oil and gas production, processing and transportation, followed by such diverse areas as cooperation in scientific research, forestry development, environmental services, agriculture, telecommunications, management training programs and health care.

Doug McDonald is Executive Director of International Energy Affairs for Alberta's Department of Energy and was party to both provincial and federal initiatives. He explained the difficulty in knowing exactly who to contact in authority in the independent states of the new Russia.

"On the one hand, Komi (where Gulf has its operations) is an autonomous republic within Russia with powers akin to that of a provincial government, at least in terms of having considerable control over its own oil and gas development."

"Tyumen Oblast, on the other hand, is a sub-regional government with a governor appointed by Moscow. The comparison that seems closest for Canadians is a territorial or municipal type of authority.

ERCB REACHES OUT TO THE NEW RUSSIA

In petroleum-rich Tyumen, in northern Russia, a $1-million study is underway which could result in the creation of a Siberian Energy Resources Conservation Board or the SERCB.

During 1992, Canadian private and public sector groups focused on the urgent need to fill the regulatory void in the former Soviet Union. At the Canadian federal level came a commitment to review Russian oil and gas regulations. At the provincial level was Alberta's understanding with the Tyumen region to develop closer ties at the government and enterprise levels.

In 1992, former ERCB Board Member Emile Morin, worked with Paladin Projects International Ltd. and the Calgary law firm of Bennett Jones Verchere on a regulatory-management project for the Russian Ministry of Fuels and Energy in Moscow. As the year drew to a close, talks were underway to integrate the Moscow and Tyumen initiatives to create a new regulatory agency modeled on Alberta's ERCB. Early in 1993, retired ERCB Chairman, Gerry DeSorcy, joined the team where he will bring his lifetime of regulatory expertise to the Moscow and Russian projects.

"The Board has a well-organized, quasi-judicial process to ensure that all interested parties have an opportunity to present their views before decisions are made."

Such initiatives came on the heels of three years of increasing numbers of Russian delegations to the ERCB. During that time, more than 50 visitors representing central and provincial governments, and producing associations in the new Russia have met with ERCB staff to discuss aspects of oil and gas regulation.

ERCB Vice Chairman Dr. Phil Prince, noted that this attention on the ERCB confirms its excellent reputation for effective regulation. At a November 1992 Conference on Natural Resource Development in Moscow, he tried to convey why the ERCB has such a good name around the world.

"One basic reason ... is our commitment to fairness. The Board has a well-organized, quasi-judicial process to ensure that all interested parties have an opportunity to present their views before decisions are made. This has been essential to the acceptance of the process by the people.

"Another important reason for the reputation enjoyed by the Board is its emphasis on technical excellence.

"Another factor contributing to our success is flexibility. A strong commitment to ensuring the industry adhered to good oilfield practices has been tempered by a willingness to adapt the rules as knowledge improved.

"A final contributing factor is a sincere and complete commitment to effective communication. There is no substitute for seeking and understanding the views of those who are affected by what we do."

Dr. Prince ended his presentation with an offer and a commitment, "The ERCB is prepared to assist by hosting teams of Russian visitors, to give you hands-on experience of what we do. We think this is a very effective way for you to distill from the experience we have had for more than 50 years, the things that will be of most value in your own regulatory structure."

"The important point is that such government structures are in flux as Moscow wrestles with moving to a decentralized model.

"Complicating the scenario further are a series of 27 petroleum producing associations across Russia, each controlling an enormous infrastructure. Little wonder that western officials have difficulty knowing who to advise, let alone providing direction about how Russian officials should adapt a new regulatory regime to fit their own situation."

According to McDonald, adaptability is the key. In his view, western governments should follow the example of private interests that are learning new approaches to doing business with their Russian partners. Companies are saying that governments in the new Russia should take what works best from other jurisdictions and develop their own regulatory framework.

Protecting the earth and aboriginal peoples

Estimates show that 10 per cent of total oil production of 525 million cubic metres per year in the former Soviet Union is lost through spills and leaks.

The pressing need to address serious environmental problems in the new Russia also provided opportunities for Canadian environmental consultants in the past year. Typical of the expertise accompanying western oil and gas development in the former Soviet Union is Calgary's HBT AGRA Limited, part of an international network of consulting environmental scientists.

Walter Younkin, Senior Vice President, says his company's industrial clients consider environmental protection and sensitivity to aboriginal issues to be the "right way to do business". Younkin notes that western companies are documenting environmental damage to ensure they will not be liable for future reclamation unrelated to their own projects. In addition, they recognize that environmental protection will likely evolve as a regulatory and approval requirement in the new Russia as it has in the West.

SEEDS DEVELOPED FOR RECLAIMING PIPELINE RIGHTS-OF-WAY IN CANADA'S ARCTIC ARE IN THEIR SECOND YEAR OF REVEGETATION TRIALS IN THE YAMAL PENINSULA OF NORTHERN RUSSIA.

Younkin's colleague, Senior Environmental Scientist Bonnie Gray, admits that when westerners see the way environmental concerns have taken a back seat to other priorities, they make false judgements about the willingness, ability and knowledge of Russian scientists to solve environmental problems.

According to Gray, Russian scientific institutes have knowledge and data, but information has not been applied to the solution of practical environmental problems. The long-term recipe for success, agree Younkin and Gray, is for Canadian experts to form partnerships with Russian scientists. Younkin describes a recent example of this idea in action.

"Reclaiming disturbed areas in an Arctic environment requires very specific grass species. Ever since the Canadian Arctic Gas project of the early 1970s, we've been testing and developing species and using them for reclamation along pipeline rights-of-way.

"We are now working with Russian soil specialists on several test plots in the Yamal Peninsula. Loading up 100 kilograms of Canadian grass seed stock is a fairly straightforward way to transfer technology that is directly applicable, visible and makes a difference. It means short cutting 30 years of trial and error."

Involving aboriginal people in business decisions that affect their life and livelihoods also is a new concept in northern Russia. Typical of new political realities in Russia are the growing links among circumpolar groups such as the Nenets reindeer herders of Yamal and leaders of Canada's northern native groups. Several Russian aboriginal leaders have visited Canada's Arctic in the past two years.

THIS NENETS BOY MAY BE PART OF A NEW GENERATION OF NATIVE PEOPLE IN RUSSIA TO EXPERIENCE THE SUCCESSFUL CO-EXISTENCE OF RESOURCE DEVELOPMENT AND TRADITIONAL LAND USES.

In the words of Gordon Rozon of HBT AGRA's Human Environment Division, "it's an eye-opener for Nenets leaders to see overlapping land uses such as petroleum development and traditional hunting and fishing in Canada. The Russian experience has been almost entirely negative. Petroleum development for them has always meant the destruction of reindeer pasture and other threats to traditional ways.

"Our advice to petroleum clients is to use western consultative approaches to land-use projects involving native peoples in Russia as a matter of policy. The rationale is simple. Gaining public input has been shown to be good business practice here. As aboriginal groups there gain autonomy and the powers that go with it, involving them will result in better projects for both the operator and the local population."

The future of Albertans in the new Russia

Points of view differ as to what's ahead for Albertans in the new Russia. Alberta Department of Energy's Doug McDonald is willing to speculate that Albertans have only scratched the surface of the potential in the former Soviet Union. According to McDonald, it's fair to say Canadians will have much stiffer competition as companies from other countries become more aggressive.

Carmen Fairman of PSAC would probably agree. As he sees it, "the immediate task is to reverse declining production, mainly by activating idle wells. In the medium term, the emphasis will be on the development of already discovered but unexploited oil and gas fields. In the longer term, foreign investors are expected to focus on the exploration and development of new oil and gas fields on the basis of production sharing."

Fairman also says that the risks of involvement are high. In his words, "Canadian companies may have difficulty getting paid and are confronted with the lack of the proper legal framework, tough and changing tax laws, an obsolete infrastructure, a legacy of environmental neglect, conservative attitudes and potential political instability."

While the government-to-government initiative tries to come to terms with the legislative and regulatory aspects of petroleum development, consultant Bob Bolton, gives an historical perspective.

"The end of the Cold War has led to economic crises around the world. Russia, in particular, is in collapse. Like the recovery in Germany and Japan after World War II, there is an unprecedented opportunity for western interests in the new Russia. The result will be good for the West, with the full knowledge that the region will one day compete on an equal footing. In my view, the energy sector will lead the way in this scenario." ■

Credits and Acknowledgements

The ERCB thanks many people for bringing together the threads of this story. Bob Bolton, Executive Consultant, Control Data Canada, Ltd., shared his first-hand experiences and an interesting explanation of the Alberta regulatory model. Vice Chairman Phil Prince outlined the ERCB's direct role, while former Board Member Emile Morin, now a consultant with Paladin Projects International Ltd., reviewed the regulatory part of the story.

Walter Younkin, Bonnie Gray and Gordon Rozon of HBT AGRA Limited provided insights into environmental and aboriginal issues, while John Sparks at Gulf Canada Resources Limited contributed information on his company's joint venture in Komi, northern Russia.

For the government dimension, Alberta Energy's Doug McDonald, and Trade Director Patti Piironen at Alberta Economic Development and Trade proved very helpful. Bill and Dean Chisholm of Sealweld Corporation Ltd. provided a first-hand look at how smaller Alberta businesses are faring in the new Russia.

The Petroleum Services Association of Canada gave permission to quote extensively from an address by President Carmen Fairman, entitled "Business Outlook 1993, Movement into World Markets", Calgary Convention Centre, 5 November, 1992.

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Special Projects Assistant, Mike Lock, is dwarfed by 8.5-metre-high storage racks at the ERCB Core Research Centre.

IN THE PUBLIC INTEREST

ERCB vision results in:

- a public that is confident the energy industry is being regulated fairly and operates in a responsible manner.

ALBERTA'S ENERGY INDUSTRY

1992 IN REVIEW

PRODUCTION, RESERVES, SALES AND MARKETS

This part of *Energy Alberta 1992* presents an overview of resource production during the year, and the effect of annual production and drilling activity on reserves.

In addition, the section explains the markets for Alberta's energy resources, energy prices during the year, and how they affected energy revenues and investment in the province.

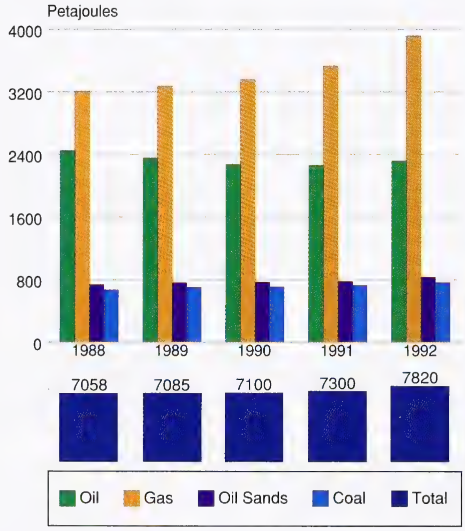
Increased oil production draws down reserves

Alberta's conventional crude oil production in 1992 was an estimated 53 million cubic metres, up slightly from the previous year. Production of pentanes—an equivalent of crude oil—totalled 7.3 million cubic metres, an 11 per cent increase over 1991 levels.

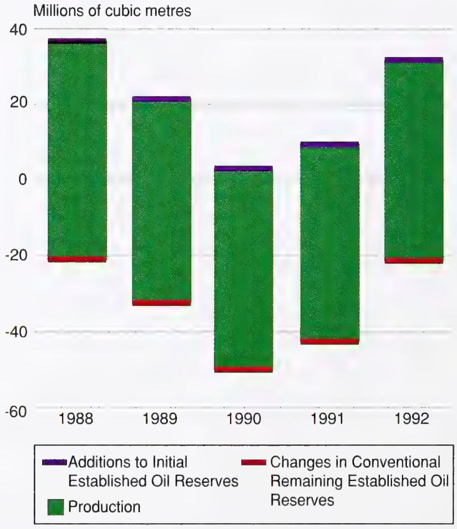
At year-end 1992, conventional oil reserves were assigned to 7000 pools in the province. Alberta's remaining established oil reserves are an estimated 446 million cubic metres.

ALBERTA HYDROCARBON ENERGY RESOURCES

5-YEAR PRODUCTION



OIL PRODUCTION AND RESERVES CHANGES



Metric/Imperial Energy Equivalents

Almost all numbers used in *Energy Alberta 1992* are metric. For imperial units, use conversions below:

Energy	1 petajoule	= energy equivalent of 164 000 barrels of crude oil
		= energy equivalent of 1 billion cubic feet of natural gas
Oil	1 cubic metre	= 6.3 barrels
Natural Gas	1 cubic metre	= 35.3 cubic feet
Coal	1 tonne	= 0.98 long ton (2240) = 1.1 short ton

Conventional oil reserves have declined at an average rate of six per cent per year since 1988. Despite a substantial increase in oil development wells that added 31.3 million cubic metres to Alberta's initial oil reserves in 1992, remaining reserves were drawn down by 21.6 million cubic metres to meet demand.

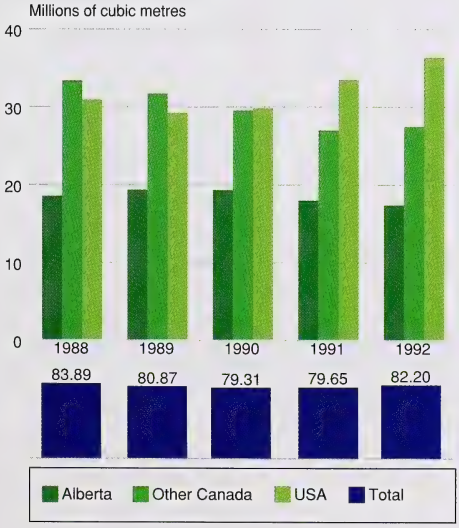
Oil sales strong to U.S. Midwest

Total 1992 sales volumes of crude oil and equivalent—that is synthetic crude oil, bitumen, pentanes plus and condensates—increased by three per cent from last year. The general downward trend in the production of light and medium crude oil was offset in 1992 by increases in volumes of conventional heavy and synthetic crude oil, as well as crude bitumen.

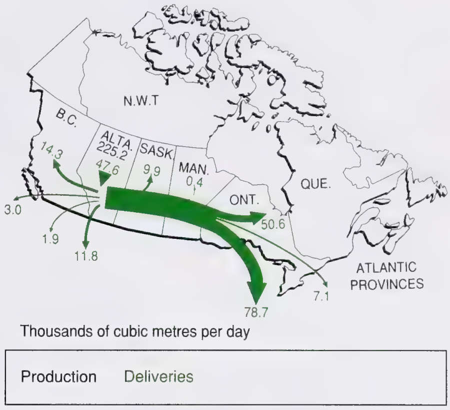
Sales of oil to eastern Canadian markets in 1992 were up almost two per cent from 1991. Sales to U.S. Midwest refineries increased 8.5 per cent to an average of 78 700 cubic metres per day.

Deliveries to Alberta refineries declined by 3.3 per cent during the year, as recessionary conditions lowered demand for refined products such as gasoline and aviation fuel in western Canada. In an effort to rationalize refinery capacity in the region, Petro-Canada, Shell Canada Limited and Imperial Oil Limited announced plans to shut down refineries in Vancouver in 1993 and 1994. The Turbo Refinery north of Calgary also closed in 1992.

MARKETS FOR OIL



MARKETS FOR OIL



Pipelines and Alberta's oil markets

Recent refinery changes in Montana increased demand for heavier crude oils and crude bitumen from Alberta during 1992. This resulted in a major pipeline reconfiguration in southern Alberta. Changes included pipeline expansions to carry more blended bitumen to Montana, flow reversals from north to south, and greater capacity to segregate sour and non-sour crude streams.

Another important development in 1992 was the lack of capacity on the Interprovincial Pipe Line (IPL) system which moves Alberta oil to eastern Canada and the U.S. Midwest. Increased oil production and IPL maintenance resulted in high levels of capacity apportionment on the system late in 1992. (Apportionment occurs when excess demand for available pipeline capacity is shared equitably among shippers and producers.) Action to resolve this problem is expected in 1993.

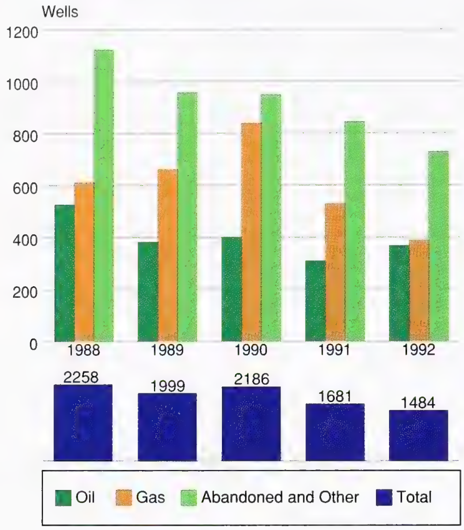
Royalty changes bring renewed drilling activity

Major changes in the provincial government's royalty system in October prompted increased drilling activity late in the yeat.

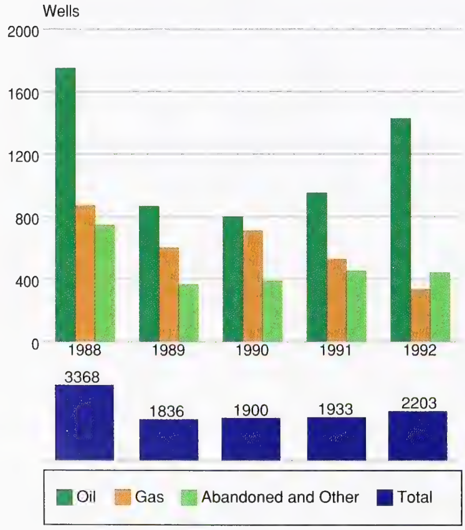
Alberta Department of Energy made royalty formulas for oil and gas more sensitive to world prices and reduced base royalty rates. In addition, the government introduced a third-tier royalty for oil pools discovered after 31 October 1992. Royalties on experimental oil sands projects were reduced to one per cent from five per cent.

Changes also introduced separate royalty levels for light and heavy crude, recognizing that heavy oil receives a lower price than light crude oil. The new system also encouraged reinvestment in aging reservoirs by lowering royalties on reactivated pools and low productivity wells, and included incentives for horizontal re-entry wells.

OIL AND GAS WELLS—EXPLORATION



OIL AND GAS WELLS—DEVELOPMENT



Simplifying the province's gas-royalty system will reduce industry administration costs by as much as 60 per cent. The most important change has to do with industry's method for calculating the government's share of gas processing costs for gas produced from Crown lands.

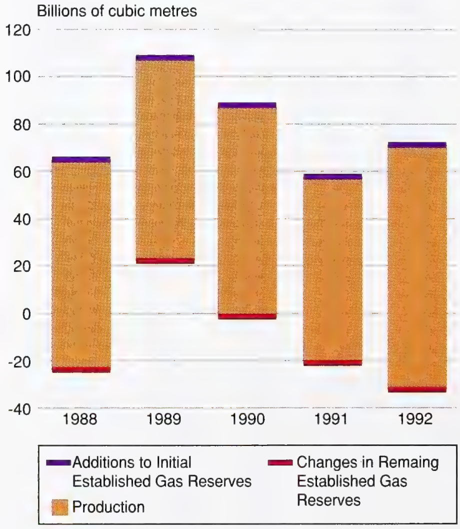
Sharp increase in gas production

1992 production of marketable gas reached a record 101.6 billion cubic metres. Companies added 71 billion cubic metres to established gas reserves, up substantially from 1991. These additions occurred despite the fact that drilling activity for natural gas declined by 31 per cent from the previous year.

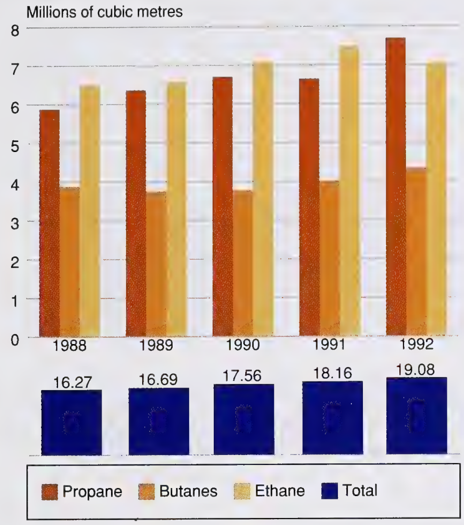
Remaining gas reserves were drawn down by an estimated 32.5 billion cubic metres during the year, because reserve additions were less than gas production. Remaining established reserves of natural gas were 1594 billion cubic metres at year-end.

Production of natural gas liquids—propane, butanes and ethane—went up 5 per cent to about 19 million cubic metres in 1992, mostly because of a 16 per cent increase in propane production.

GAS PRODUCTION AND RESERVES CHANGES



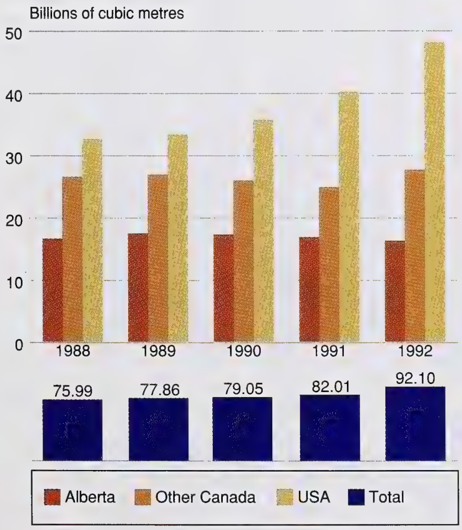
NATURAL GAS LIQUIDS PRODUCTION



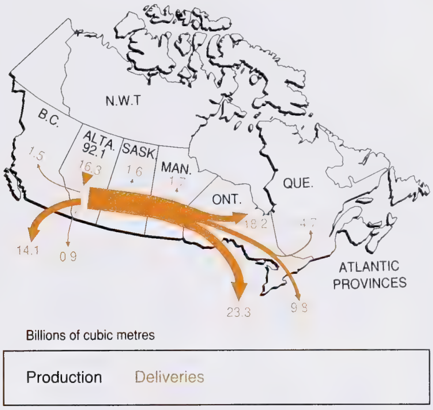
Record gas sales to U.S.

Marketable gas sales increased by almost 12 per cent in 1992. Alberta consumers used 3.4 per cent less than the previous year. However, this was offset by an almost nine per cent increase to other Canadian markets, and an 18 per cent increase to U.S. destinations.

MARKETS FOR GAS



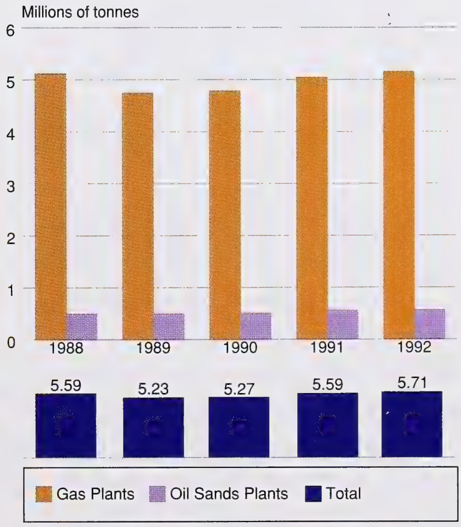
MARKETS FOR GAS

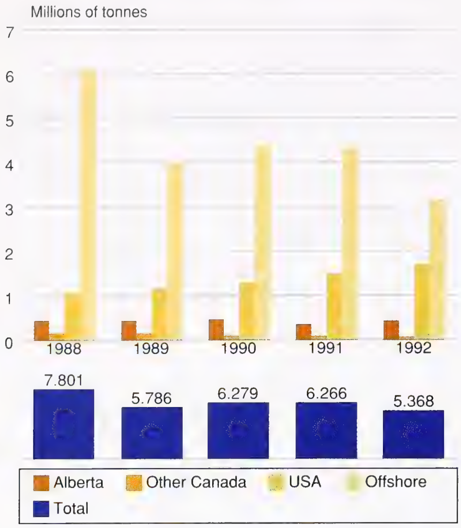


Sulphur prices plummet, stockpiling begins

Increased competition in world sulphur markets led Alberta producers to curtail overseas shipments by 27 per cent and stockpile sulphur. The year's sulphur production totalled 5.4 million tonnes. The year's production exceeded shipments, ending the stockdraw which had reduced inventories from a three-year supply at the beginning of the 1980s to only six months at the end of 1991. Shell Canada's Caroline Project will boost total Alberta sulphur production significantly when the project comes on stream in 1993.

SULPHUR PRODUCTION





MARKETS FOR SULPHUR

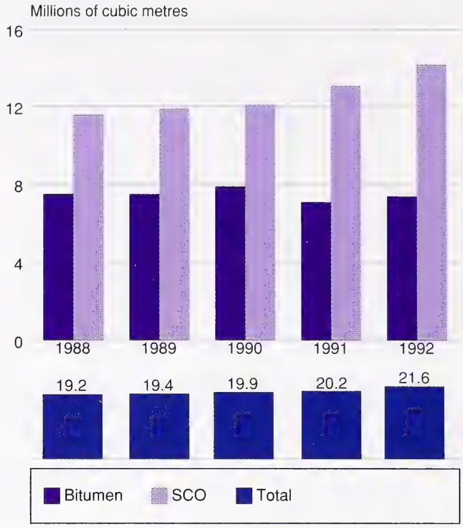
Other markets in the U.S., Alberta and the rest of Canada absorbed some of the province's excess sulphur production, but overall sulphur deliveries declined 14 per cent from last year.

Another record year for oil sands

Production of synthetic crude oil from two plants at Fort McMurray totalled 14.2 million cubic metres, more than eight per cent higher than 1991's record output. All of the increase was attributable to Syncrude Canada Ltd.'s record production of 10.7 million cubic metres. Suncor Inc.'s output declined to 3.5 million cubic metres, the result of operational difficulties following a March 1992 fire at the plant.

Crude bitumen production from in-situ areas was 7.4 million cubic metres for 1992, up from 1991 levels but still below the record of eight million cubic metres set in 1990. Two heavy oil upgraders, one in Saskatchewan and another in Montana, came on stream during the year and began processing Alberta's heavier oils which include crude bitumen.

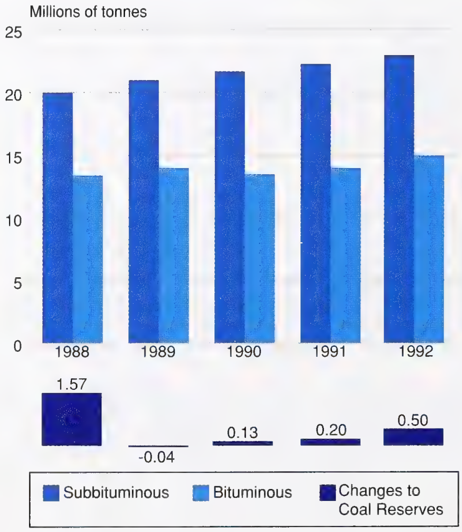
Initial established reserves of crude bitumen are estimated to be 747 million cubic metres from deposits under active development. This consists of 644 million cubic metres of reserves from surface-mineable projects and 103 million cubic metres from in-situ schemes.



BITUMEN AND SYNTHETIC CRUDE OIL PRODUCTION

Alberta coal exports increase to Brazil and Korea

Alberta's 1992 production of raw coal increased almost five per cent over 1991 levels to an estimated 38 million tonnes compared to 36.3 million tonnes last year. Raw coal is run-of-mine coal, that is, unprocessed coal loaded in the mine. Alberta's reserves of raw coal—those recoverable using surface and underground mining methods—reached 33 billion tonnes at year-end.



COAL PRODUCTION AND RESERVES CHANGES

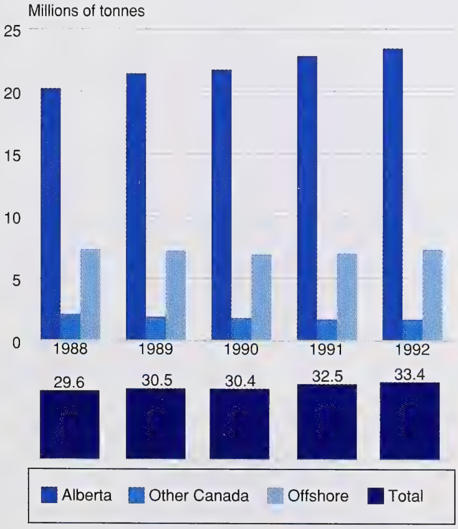
Deliveries of marketable coal increased almost three per cent to an estimated 33.4 million tonnes for the same period. Marketable coal includes subbituminous raw coal and bituminous raw and clean coal (processed product with a uniformly low ash content) delivered to market.

Deliveries of metallurgical coal to Japan—Alberta's most important export market—declined by about ten per cent in 1992. The main reason was a downturn in Japanese steel production and a build-up of coal stockpiles in that country. Alberta coal shipments increased to Brazil and Korea, replacing supplies interrupted by labour disputes at mines in southeastern British Columbia.

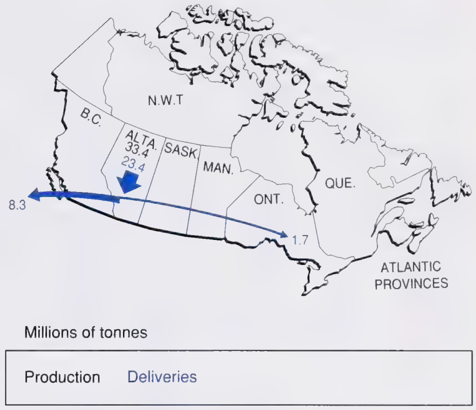
Although worldwide demand is growing for coal used to produce electricity, Alberta's exports of thermal coal are expected to decline in 1993 with the expiry of Luscar Ltd.'s 15-year coal supply agreement with Ontario Hydro. A new three-year contract reduces coal purchases from 1.8 to 1.2 million tonnes per year.

Of Alberta's total coal production in 1992, just over 70 per cent was used to generate electricity within the province.

MARKETS FOR COAL



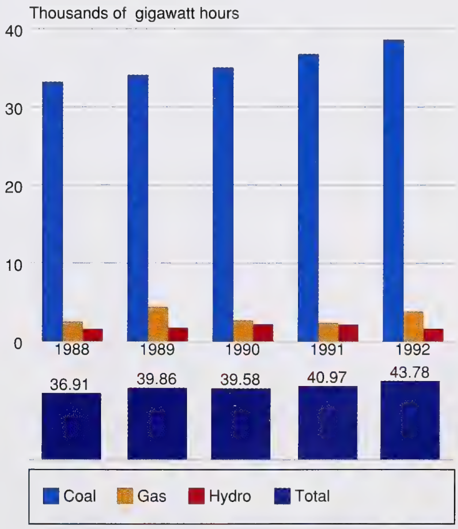
MARKETS FOR COAL



Slow growth for electric generation and capacity

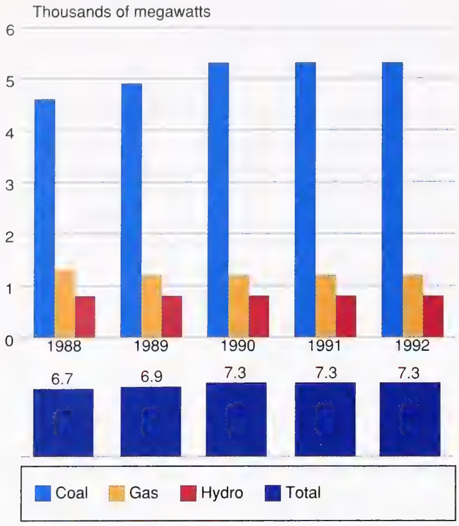
Alberta's electric utilities generated almost 44 thousand gigawatt hours of electricity during 1992, up about seven per cent from last year. During the year, coal supplied almost 88 per cent of the province's electrical needs, with gas and hydro at 8.5 and 3.5 per cent, respectively.

ELECTRICITY GENERATED



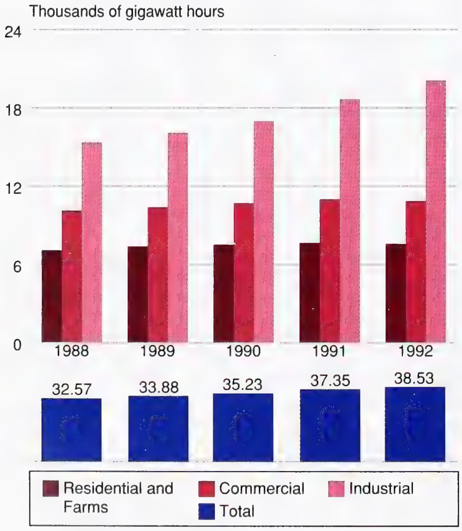
Electricity's equivalent to reserves is generating capacity; that is, the amount of electric power that could be generated from all sources in the province. For 1992, Alberta's generating capacity was 7.2 thousand megawatts, essentially the same as in 1991.

GENERATING CAPACITY FOR ELECTRICITY



Sales of electricity in Alberta increased 3.3 per cent in 1992 from 38.5 thousand gigawatt hours compared to just over 37 thousand in 1991. The industrial sector showed the only gain with a 7.8 per cent growth in demand. For the first time, industrial users consumed more electric energy than residential, farm and commercial users combined.

MARKETS FOR ELECTRICITY



ENERGY END-USE IN ALBERTA

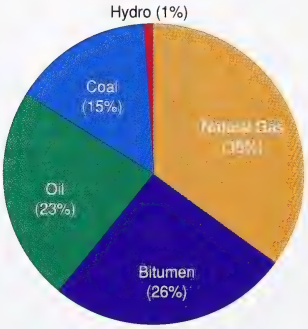
Albertans consumed about a quarter of the total amount of energy produced in the province in 1992. Some of this energy, in turn, was used to make products for eventual sale beyond Alberta's borders.

One new example of this is Alberta Envirofuels Inc.. In May 1992, the company officially started producing MTBE, an additive derived from natural gas and used to enhance the octane rating of gasoline. North American demand for MTBE by gasoline refiners was robust because the additive replaces the use of lead which was phased out in 1990.

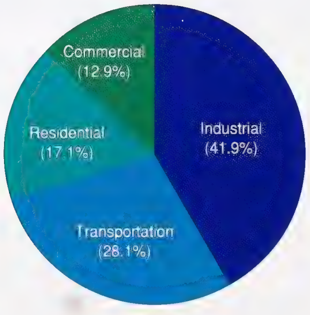
Other 1992 industrial developments that rely on natural gas feedstocks included Dow Chemical's Canada Inc.'s new ethylene plant and Novacor's planned 10 per cent expansion of its ethylene facility at Joffre, east of Red Deer.

The charts below show how each of Alberta's energy resources contributed to meeting Alberta's own requirements in 1992. The relative draw of each end-use sector on energy consumption also is shown in the chart below.

ENERGY RESOURCES USED TO MEET
ALBERTA'S END-USE REQUIREMENTS 1992



1992 END-USE REQUIREMENTS IN ALBERTA



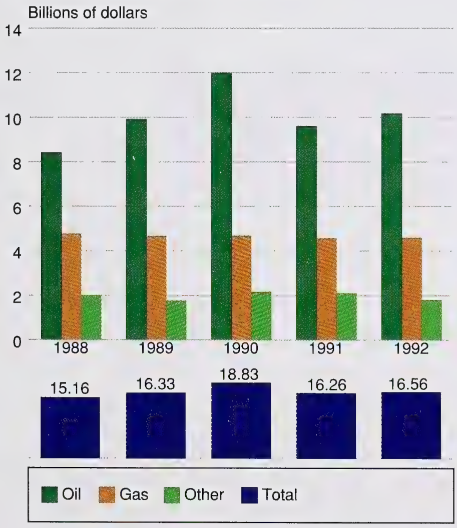
PRICES, REVENUES, INVESTMENT AND EMPLOYMENT

Energy revenues grow by two per cent

Alberta's energy industry is the largest component of the province's economy. For the 1992/93 fiscal year ending in March, the energy sector contributed an estimated $2.25 billion in royalties and other levies to the public purse. This represents about 21 per cent of total provincial government revenue. Based on Statistics Canada data, Alberta's energy sector accounted for 23.6 per cent of the province's Gross Domestic Product in 1992, down slightly from 1991.

Total sales of Alberta's hydrocarbons and sulphur amounted to $16.6 billion in 1992, about two per cent higher than 1991 revenues. Oil and equivalent accounted for about 60 per cent of energy revenues in 1992. Sales of marketable gas, natural gas liquids and sulphur made up another 35 per cent, with coal completing the revenue picture. The value of Alberta's sales of electricity for the year totalled $2 billion.

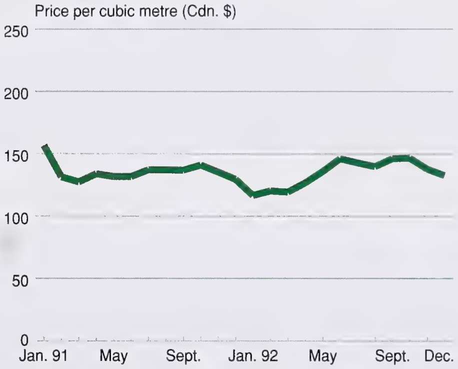
GROSS REVENUES—ALL HYDROCARBONS



Oil prices average $21 per barrel

At the beginning of 1992, the average Alberta field price for light and medium crude oil stood at $116 per cubic metre ($18.55/bll). This increased gradually to about $146 per cubic metre at mid-summer and then stabilized for the remainder of the year. At year-end, prices were down to just over $133 per cubic metre as OPEC countries produced more oil than their agreed quotas.

ALBERTA AVERAGE WEIGHTED FIELD PRICE FOR LIGHT OIL

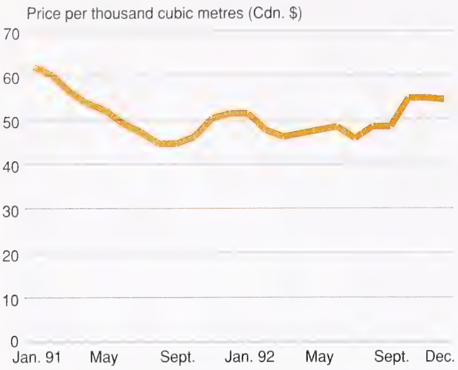


Spot prices for gas rise late in year

The 1992 Alberta average market price for natural gas was $50 per thousand cubic metres ($1.31/gigajoule), almost four per cent lower than the 1991 average. Prices for Alberta gas declined throughout the year until the fourth quarter. At that time, spot and long-term export prices climbed above $75 per thousand cubic metres ($2.00/gigajoule).

Export prices for natural gas were affected substantially by weather. When Hurricane Andrew struck the southeastern U.S. in August, the storm disabled several Gulf Coast and offshore gas production facilities, triggering the first significant increase in spot gas prices in North America for several years. Since then, gas prices remained sharply higher, sustained by a late-December cold snap in western Canada, and tight capacity on the NOVA pipeline system.

ALBERTA AVERAGE MARKET PRICE FOR GAS



Sulphur prices plummet

By November 1992, average export sulphur prices dropped to about $9.30 per tonne, drastically less than highs of $135 per tonne in the mid-80s. The problem was sulphur flooding the world market, especially from Poland and Saudi Arabia. In addition, the worldwide downturn in global agricultural output reduced demand for fertilizer, of which sulphur is the mainstay.

Stronger Canadian dollar improves prices for coal

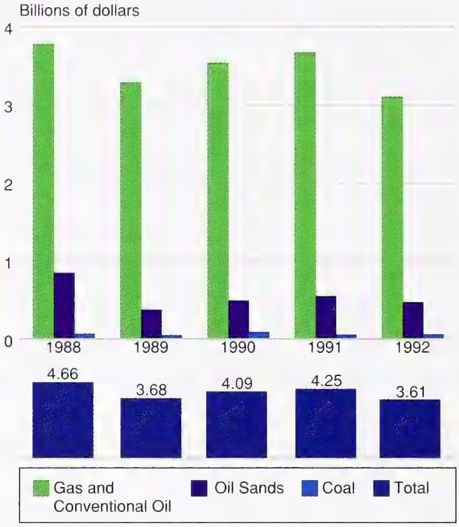
The average price of bituminous metallurgical coal exported to Japan fluctuated around $32 per tonne in 1992. This represented a slight increase in price because of the favourable position of the Canadian dollar against the currencies of coal-importing countries. Bituminous thermal coal bound for Ontario Hydro and Japanese industrial users hovered at $30 per tonne.

The average price of coal used to generate electricity within Alberta increased slightly from $9.41 in 1991 to $9.55 per tonne in 1992.

Investment and employment decline

Alberta's energy industry reduced overall capital investment in 1992 by 15 per cent to $3.6 billion, according to Statistics Canada data. Nevertheless, the investment community reported that the country's oil and gas industry raised about $2.5 billion in 1992 in new and secondary stock offerings, more than any other Canadian industrial sector.

ENERGY INVESTMENT IN ALBERTA



In November 1992, the Canadian Energy Research Institute released a report entitled *Employment in the Canadian Oil and Gas Industry 1985-1992*. According to the report, upstream employment fell from about 71 000 people in 1985 to about 54 100 in 1992, or 24 per cent. This sector includes exploration and production companies, drilling and service rig contractors, service and supply companies, scientific and technical consultants, and industrial/construction employers.

Statistics Canada reported that employment in downstream sectors such as pipeline transport, petrochemicals and refineries increased from 12 900 to 15 500 people during the 1985-92 period, a 20 per cent increase.

ALBERTA IN THE CANADIAN ENERGY PICTURE

Of all the types of energy produced in Canada, almost three quarters comes from Alberta. In 1992, Alberta's hydrocarbon reserves accounted for an estimated 67 per cent of Canada's total of fossil fuels. Alberta has about 85 per cent of the country's conventional oil and gas reserves, and 57 per cent of coal reserves. The province has all of the country's reserves of oil sands, but virtually no potential for hydroelectric development.

The chart below summarizes Alberta's energy picture. It shows Alberta's remaining reserves and marketable production at the end of 1992, the province's overall sales position and proportion of reserves.

ALBERTA'S ENERGY RESOURCES —A SUMMARY

Remaining Reserves at the end of 1991

	Alberta (petajoules)	Per cent of Canada
Conventional Oil and Pentanes	22 517	85
Natural Gas and NGLs	64 387	91
Bitumen and Synthetic Crude Oil	178 415	100
Coal	648 000	60
Total	913 319	67

1992 Production

	Alberta (petajoules)	Per cent of Canada
Conventional Oil and Pentanes	2 316	76
Natural Gas and NGLs	3 915	87
Bitumen and Synthetic Crude Oil	828	100
Coal	760	57
Hydro	6	1
Total	7 825	73

1992 Sales (petajoules)

	To Alberta	To Other Provinces	Exports	Total
Conventional Oil and Equivalent	666	1 052	1 435	3 153
Natural Gas and NGLs	646	1 074	1 883	3 603
Coal (Marketable)	468	34	59	561
Hydro	6	0	0	6
Total	1 786	2 160	3 376	7 322
Per cent of Sales	24	29	46	100

ERCB inspector Mike Pittman (right) gives the rig manager at Akita Drilling Rig #47 near Quirk Creek a "satisfactory" rating for rig operations .

BALANCE AND FAIRNESS

ERCB vision results in:

- **an energy industry that understands, respects and meets or exceeds regulations and standards . . .**
- **government organizations that are satisfied that all matters of mutual concern are addressed and co-ordinated.**

CONVENTIONAL CRUDE OIL

Provost hearing focuses on heavy oil and dairy industry

The oilfields of east-central Alberta are currently the most active in the province. Close well spacing, pad drilling, storage tanks and flare stacks are now commonplace in an area that once was quiet farmland.

From January to May 1992, the ERCB convened a 26-day hearing in the town of Provost. The hearing resulted from applications by Amax Canada Petroleum Inc. to drill 55 infill wells into a formation underlying the Skinner family dairy operation, and an application from the Skinners to review the operation of existing Amax facilities. The hearing focused on the ability of the oil and dairy industries to coexist in extremely close proximity to one another.

The hearing was the longest on record involving the farming and energy industries. Almost 4000 pages of testimony examined issues dealing with operating practices, resource development and environmental issues.

In a decision released early in 1993, the Board concluded that the Amax/Skinner situation was unique. The Board ordered nine wells near the Skinner farm to be abandoned and reclaimed within four years. In addition, the Board decided that a battery that takes production from nearby wells must be moved to another site by early 1994.

The decision also emphasized the importance of responsible industry action early in project development, continuous public contact and prompt problem resolution.

ERCB changes regulations for horizontal wells

Horizontal oil-well drilling in Alberta has increased significantly in the past two years. In 1992, companies completed 116 horizontal wells, bringing the total number in the province to 226.

THE ERCB STREAMLINED ITS APPLICATION REQUIREMENTS IN 1992 IN RESPONSE TO INCREASING NUMBERS OF HORIZONTAL WELL APPLICATIONS FOR OIL, GAS AND OIL SANDS DRILLING.

With this increasing interest, the ERCB found that its regulations did not specifically address several situations related to horizontal wells. In response to recommendations from an ERCB/industry task force, the Board issued Interim Directive ID 92-4 in September 1992. The directive streamlined the ERCB's processing of spacing applications for horizontal oil wells and eased production restrictions. In addition, the ERCB is monitoring horizontal drilling to protect the rights of each operator in an oilfield. ■

NATURAL GAS

In 1992, the ERCB completed one public consultation process and started another that should conclude a number of years of research on sour-gas safety. The aim is safe and appropriate separation distances between sour-gas facilities and the public.

Public consultation yields important recommendations

In the fall of 1991, the Northeast Calgary Application Consultation Committee (NCACC) was formed in response to Canadian Occidental Petroleum Ltd.'s (CanadianOxy) desire to drill additional gas wells on the eastern boundary of the City of Calgary.

The group concluded its work in June 1992. By working closely with the company, municipal and provincial government agencies, and land developers, the NCACC was able to agree on criteria which, if met, could make sour gas development acceptable in the area.

The NCACC was made up of representatives of Calgary communities that could be affected by the proposed wells. The purpose of the group was to provide input to decision-making at an early stage. CanadianOxy is now expected to use the NCACC recommendations in tailoring its development to satisfy residents' concerns on issues such as public safety and land use. In addition, the ERCB will use the results to guide its review and decisions.

Review of sour gas safety and risk

In November 1992, the ERCB launched a public consultation process to carry out a generic review of safety measures used by the ERCB to regulate the development of sour-gas facilities.

The review was prompted by public concerns about the development and operation of sour facilities near urban and rural residences. Community representatives working on proposed sour-gas projects for northeast Calgary also requested the review.

The Board invited major stakeholders to provide representatives to sit on an Advisory Committee. The committee's role was to identify the scope of the study and to review relevant issues. The committee's work is expected to be complete by mid-1993.

THE NORTHEAST CALGARY APPLICATION CONSULTATION COMMITTEE CONCLUDED MONTHS OF EFFORT WITH THIS CELEBRATORY BARBECUE IN JUNE 1992.

AN EXTENSIVE ERCB STUDY OF FUTURE GAS SUPPLY SHOWS THAT GAS PLANTS SUCH AS THIS ONE WEST OF CALGARY CAN BE ASSURED OF HEALTHY GAS QUANTITIES WELL INTO THE NEXT CENTURY.

Major study shows good prospects for gas discoveries in Alberta

In response to growing interest in Alberta's long-term gas supply, the ERCB completed a major study in June 1992. Entitled *Ultimate Potential and Supply of Natural Gas in Alberta*, it was the culmination of two years of work and 11 person-years of effort. The report provided the most comprehensive update of the long-term gas potential in the province since 1979.

The focus of the study was natural gas geology and economics. Geological analysis involved a detailed review of available data for 112 gas play areas in Alberta. The study resulted in estimates of gas potentially available in each of these areas.

The report's economic analysis assessed the effects of various gas prices on recoverable gas reserves. The study also included a 15-year forecast of the annual supply and demand for Alberta gas, a review of unconventional gas resources (i.e. coalbed methane and tight gas) and an overview of recent technological advances in gas recovery.

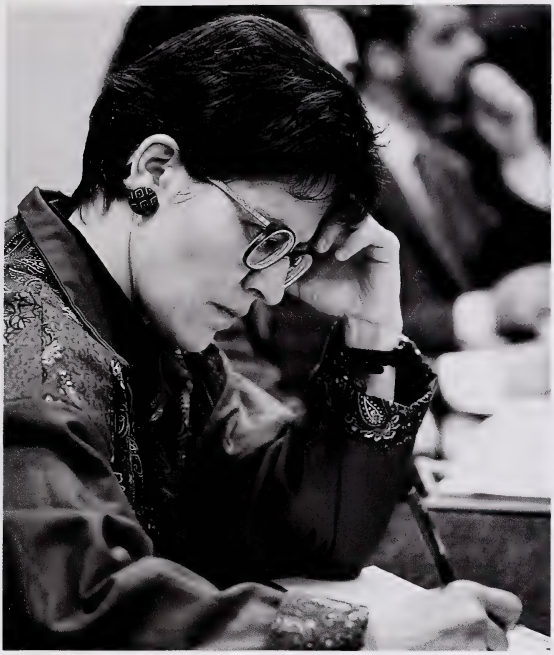
According to a Medium Case scenario, the estimate of the ultimate potential for conventional marketable gas is 5600 billion cubic metres (200 trillion cubic feet). Given reasonable prices, the ERCB expects that this supply would meet demand until early in the next century. Unconventional Alberta gas likely will be available to meet any shortfall for many years after that, thus ensuring a healthy Alberta gas industry well into the next century.

The 400-page report of interpretation, maps, tables and figures also includes 34 large colour maps generated as part of the geological study. The report is considered to be the most detailed of its kind ever done for any gas-producing area in the world.

Two pipelines vie for California gas market: ERCB gathers information

The export of Alberta gas to the California market became a contentious matter late in 1991 because of two major pipeline proposals, one by Pacific Gas Transmission Company (PGT) and the other by the Altamont Gas Transmission Company.

In response to a concern that the California market might not be able to support two such large pipelines, the Government of Alberta asked the ERCB to gather information on both proposals without making specific recommendations. The government believed there were gaps in information available in the public domain which might hinder general decision-making.



ASSISTANT MANAGER LYNDA HOLIZKI WAS PART OF THE MULTI-DISCIPLINARY TEAM OF ENGINEERS AND ECONOMISTS THAT REVIEWED INFORMATION ON TWO MAJOR PIPELINE PROPOSALS IN 1992.

After hearing submissions from interested parties in April, the ERCB issued its report in late June 1992. The report contained a number of interpretive comments on issues such as market supply/demand, netbacks and contractual commitments.

Following the release of the ERCB report, Altamont surveyed gas producers in the province and decided on a one-year delay of its project. The PGT project is scheduled to begin service on 1 November 1993.

By year-end, the ERCB had received 15 related applications to remove gas from Alberta. The quantities represented 45 per cent of the total required by PGT to fill space on its line. In the fall, NOVA filed applications for facilities to expand its pipeline system to deliver gas to the PGT project. A public hearing to consider the applications took place in January 1993. In March, the ERCB approved all of NOVA's applied-for expansion. ■

OIL SANDS

Syncrude seeks regulatory changes to enhance production

Syncrude Canada Ltd. applied during 1992 to amend its commercial approval. At a public hearing planned for 1993, the ERCB will consider the following requests:

- an increase in synthetic crude production from 10 to 12.6 million cubic metres per year
- permission to process crude bitumen from off-lease sources (e.g. from the Cold Lake area)
- a five-year extension to the lapse date for construction of expansion facilities
- an extended project expiry date of 2025

As an interim measure, Syncrude received regulatory approval in December 1992 to produce 10.5 million cubic metres of synthetic crude for the year, and to process 300 thousand cubic metres of crude bitumen from off-lease sources in 1993.

More changes announced for oil sands mining operations

Suncor Inc. announced plans in 1992 to reduce SO_2 emissions from its Mildred Lake Plant. This $300-million project includes the construction of a new power generation facility. It will utilize a fluidized bed burner for cleaner combustion of the high sulphur coke produced at the plant.

Suncor also will invest $100 million to replace its existing bucketwheel mining system with a truck and shovel operation. The switch is scheduled to begin in October 1993 with completion by mid-1994.

Suncor's plans for new equipment and construction—combined with workforce reduction of between 350 and 400 employees—should reduce the cash cost of producing a barrel of synthetic crude by $5-7 per barrel by 1996.

In addition, Suncor acquired additional oil sands leases in 1992 which will provide sufficient reserves to sustain production at current rates for 50 years. Suncor and Syncrude have jointly applied to exchange ore reserves along their common lease boundary. The lease exchange is to access recoverable reserves under Highway 63. Contingent with this project is the relocation of the highway.

SYNCRUDE SOUGHT REGULATORY APPROVAL IN 1992 FOR PLANS TO FURTHER EXPAND ITS 14-YEAR-OLD PLANT AT FORT MCMURRAY.

Primary recovery is trend for in situ projects

Many operators of Alberta's in-situ projects are finding it economical to bring crude bitumen to surface using primary recovery methods. This means replacing a variety of stimulation methods with vertical or horizontal wells, and producing bitumen using special pumps and natural underground pressures.

In the Cold Lake area, Suncor received approval to change its Burnt Lake commercial in-situ scheme from cyclic steam stimulation to primary recovery. During 1993, the company will add 44 wells to 18 producing wells, and will start up a 1000-cubic-metre-per-day treating facility.

Koch Exploration Canada, Ltd. also announced plans in 1992 to develop oil sands leases south of Cold Lake. Koch plans to spend more than $29 million per year for 15 years on drilling, and invest $120 million on a pipeline to Hardisty. The development would be in four phases using primary production methods.

In the Elk Point area, PanCanadian Petroleum Limited and Amoco Canada Petroleum Company Ltd. applied for reduced well spacing that would change their schemes from thermal to primary recovery. PanCanadian plans to use horizontal wells from existing locations. Amoco's development would proceed using multiwell pad drilling with 64 wells per section.

Horizontal drilling popular for experimental oil sands projects

For facilities in the Peace River oil sands area, Shell Canada Limited asked the ERCB to amend its commercial project and approve a horizontal well pilot. Shell proposes to test the economic and technical feasibility of bitumen recovery using surface-accessed horizontal wells in combination with an enhanced, steam-assisted gravity process. The results of the project could assist in commercial expansion options for the Peace River reserves.

CS Resources Limited received approval for an experimental project to drill and produce two new horizontal wells at the Pelican Lake Project. To utilize this technology fully, the company drilled three 500-metre lateral arms off the main horizontal sections in each well.

The company also completed two other horizontal well variations at a primary production project, a "J" profile in one well, and a single lateral in the other.

The Alberta Oil Sands, Technology and Research Authority received approval in June to construct a new 600-metre tunnel with three horizontal well pairs at the underground test facility northwest of Fort McMurray. An earlier phase continued to test steam-assisted gravity drainage to long horizontal well pairs.

Water and air quality dominate oil sands environmental agenda

Water continued to be the most important environmental problem facing Imperial Oil at its Cold Lake commercial project as the company announced the start-up of Phases 7 and 8. In June, Alberta Environmental Protection approved the company's request to use 3.3 million cubic metres of water for a year. Lake and groundwater levels dropped during summer drought conditions. In response to public pressure, a Task Force was formed in August to update the Cold Lake/Beaver River Water Management Plan.

The trend to primary recovery provides some relief by reducing water use. However, primary recovery leads to greater sand production, and associated problems of oily waste storage and disposal. Approvals issued for primary production require monitoring of sand volumes and satisfactory disposal plans. In Lindbergh, an Amoco-led consortium is disposing of produced sand by injecting it into a developed salt cavern.

Progress continued in 1992 on efforts to reduce odour emissions from oil sands plants, and to improve air quality in the Fort McMurray region. Suncor focused on an Odour Abatement Program from all operational sources. The company plans to eliminate all major odour sources in 1993. ■

COAL

After four years of increased coal drilling in Alberta, 1992 saw a levelling-off of exploration activity. Some 1400 exploration and development holes were drilled during the year, about the same number as in 1991.

Most exploration occurred around producing mines to delineate pits and to prove reserves for future permit extensions. In addition, five new mine project areas were drilled in 1992.

The ERCB issued 48 mine development approvals in 1992, compared to 54 the year before. The ERCB granted six mine permit extensions. These included one for the Coal Valley mine near Edson, and extensions for two surface mines and one underground mine near Grande Cache.

Four of these projects were major developments requiring provincial environmental impact assessments and screening under the Federal Government's Environmental Assessment and Review Process. No public hearings resulted from this process in 1992.

This comprehensive approval process was coordinated by the ERCB's "one-window" approach. In effect, the company prepares a single application for the ERCB which is reviewed by as many as a dozen government departments.

THE ERCB'S ABANDONED MINE FILE PROVIDES VALUABLE INPUT FOR GROUPS CONSIDERING NEW USES FOR OLD COAL MINES SUCH AS THIS HISTORIC MINE SITE IN EAST COULEE.

Trend to self-regulation

ERCB coal mine inspections have been reduced to an as-needed basis because of a high degree of self-regulation within the coal industry. Key success factors in this scenario were Alberta's small number of operators and their positive record of compliance with regulations.

Following the Westray mine tragedy in Nova Scotia, ERCB inspectors worked with Alberta Occupational Health and Safety to review safety procedures at Alberta's single underground mine in 1992.

After a serious fire last year that damaged a three-kilometre tunnelway at Smoky River Coal Limited, the company repaired its coal conveyor system and resumed operation of the tunnelway early in 1992.

Late in the year, the Natural Resources Conservation Board released its decision on the Three Sisters Project. The Board recommended ERCB technical involvement on a committee reviewing potential problems for resort developers from abandoned underground mines in the Canmore area.

In addition, the Coal Department began a review of its Abandoned Mine File. The update was necessary to provide information to various land-use approval authorities under proposed guidelines for developing mined lands. ■

ELECTRICITY

Demand for electricity in Alberta continued to grow at the relatively low rate that has prevailed since the early 1980s. Consistent with this pattern, the development of new electric generating facilities in the province also has slowed.

Utilities focus on reliability

In April 1992, the ERCB gave Edmonton Power the go-ahead to complete the second unit at the Genesee Power Plant. This decision followed a number of deferrals because of low growth in demand for electricity. The unit will make power available to the provincial electric grid in time for the 1994/95 winter peak-load.

To improve the reliability of the supply of electricity to northwestern Alberta, Alberta Power Limited relocated a 20-megawatt gas-turbine unit from its Simonette Plant northwest of Edmonton to its Rainbow Lake Power Plant.

Alberta Power also received approval to add a 3000-kilowatt gas-fired unit to its Palisades Power Plant in Jasper National Park. This gave added security of supply to the townsite since Jasper is not interconnected with the rest of the provincial electric system.

Edmonton Power received approval to dismantle and remove two 30-megawatt gas turbine units from its Rossdale Power Plant in downtown Edmonton. Installed in the mid-1950s, the units had not operated for several years.

In keeping with reduced load growth for electricity was the diminished need for new transmission lines. The few that proceeded in 1992 were lines to supply major industrial developments or to improve reliability of supply to certain areas of the province.

In April 1992, the ERCB held a hearing to consider a proposal by TransAlta Utilities Corporation to build a 138-kV line from Edson to the Kaybob area. The hearing focused on concerns related to the route proposed for the line.

TransAlta also completed construction of a 240-kV transmission line from its Sundance Power Plant to Entwistle, west of Edmonton. Another 138-kV line from Edson to Hinton improved reliability for that community.

Other 1992 transmission projects included 138-kV lines to supply the new Shell Caroline Gas Project, including a substation in Red Deer. In northeastern Alberta, Alberta Power was granted approval to relocate a number of lines in the Fort McMurray area to to allow extensions to oil-sands mining.

Reviewing the regulation of Alberta's electric industry

During a decade of uncertainty respecting demand for electricity, the regulation and structure of the electric industry has become a topic of interest across North America. Alberta is no exception.

A forecast prepared by the province's Electric Utility Planning Council in the summer of 1992 suggested that additional generating capacity would not be needed in Alberta until the end of this decade. Major utilities appeared to concur and they have no plans to add capacity in the near future.

During 1992, the Alberta Government continued to review the structure of the province's electric industry and its regulation by the ERCB and the Public Utilities Board. The review is looking at the following:

- the respective roles of the two boards
- policy on independent power producers
- export policy and the Electric Energy Marketing Act
- transmission access
- integrated resource planning
- demand-side management
- fuel use policy
- small power producers
- competitive process for new generating plants
- evaluation of environmental and social impacts of electrical facilities

The government proposes to involve the public and other stakeholders in this review process. Work is expected to conclude by the end of 1993.

Non-utility generators promise future growth

1992 saw the continued development of a number of small power projects under Alberta's Small Power Program which was introduced in 1988. The program requires utilities to purchase small plant output at a prescribed rate. To foster such projects, utilities bought this extra power whether or not it was needed to meet demand.

By year-end, several small hydro and wind-power plants were generating electricity for the provincial power grid. Several others, including a wood-waste fired plant at Whitecourt, were under construction, and a number of plants were still in proposal stages.

Outside the scope of the Small Power Program, the ERCB approved a 2.5-megawatt gas-fired plant at Zama Lake. The gas is produced in association with oil and would otherwise be flared.

Early in 1993, the ERCB denied approval for a gas-fired turbine at Stettler that was the subject of an August 1992 hearing. The application was denied on the basis that new electric generating capacity was not required. ■

THE DICKSON DAM SOUTHWEST OF RED DEER STARTED PRODUCING HYDROELECTRICITY IN 1992 UNDER ALBERTA'S SMALL POWER PROGRAM.

PIPELINES

The ERCB licensed 4800 kilometres of new pipelines for 1992, down from 7200 kilometres in 1991. Only part of this decline resulted from less pipeline construction during the year. Most of the decrease was an anomaly caused by an ERCB administrative decision that extended the time operators had to submit final licence confirmation.

Problems trigger review of operation of NOVA pipeline system

In June 1992, Alberta's Minister of Energy asked the ERCB to review the regulation of NOVA operations in response to concerns of shippers and producers. Issues included how the need for new facilities is determined, how pipeline tolls and tariffs are assessed, as well as other contractual matters. The Board held an informal review with industry participation.

The ERCB report to the Minister was released in August 1992. It discussed 14 specific issues such as contract relief, roll-in of third-party charges, and peak day supply availability. The range of opinions among participants indicated the difficulty in trying to resolve these issues.

The report also discussed several regulatory alternatives that could address some or all of the issues. These ranged from modest changes to a regime that would see NOVA pipeline operations become fully regulated.

Pipeline failure to improve emergency coordination

A major pipeline failure and fire occurred on 8 January 1992 on NOVA's Western Alberta Mainline pipeline near Caroline. In a September report, the ERCB found that the pipeline failed because of a cracked weld. The problem resulted from welding procedures that deviated from prescribed standards, and because of stress from prior construction activity and higher-than-normal pipeline pressure. The ERCB is monitoring NOVA's review of design factors and procedures that led to the failure.

According to the report, NOVA responded properly and effectively to contain the incident. To prevent future delays in notifying the ERCB, public and media, the Board recommended that NOVA use one centre for emergency response coordination. The Board also encouraged NOVA to address heightened sensitivity to energy-related emergencies in the area. ■

ALBERTA GAS PRODUCERS AND SHIPPERS CROWDED INTO THIS ERCB REVIEW OF THE OPERATION OF NOVA'S PIPELINE SYSTEM.

ENVIRONMENTAL INITIATIVES

Oilfield wastes subject of general bulletin to industry

The ERCB continued to work with industry to improve oilfield waste handling and disposal during 1992. General Bulletin GB 92-10, issued in June 1992, addressed the use of waste crude oils to suppress dust on gravel roads, as road surfacing material, or as a road construction material.

This effort characterized the types of crude oil wastes in the province, especially in localities that produce heavy oils or crude bitumen. The appropriate use for each type of oilfield waste was then established. New guidelines permit industry to carefully recycle some waste materials in an environmentally benign manner, while others must be disposed of in ways similar to hazardous wastes.

The ERCB has been working since 1987 to develop new requirements for the disposal of drilling waste from oilfield sumps. In 1992, the Alberta Research Council completed its study of sumps and suggested testing requirements for disposal. An ERCB directive on drilling waste disposal and related training programs for government and industry neared completion early in 1993.

The ERCB and the Environment Protection and Enhancement Act

When the Alberta Government released its new draft environmental legislation in 1992, debate emerged concerning the mandates of the ERCB and the newly-formed Natural Resources Conservation Board (NRCB).

As a result, the ERCB recommended changes to the Energy Resources Conservation Act that would clarify the ERCB's jurisdiction on environmental matters so that NRCB and ERCB mandates are alike. The changes will come into force when the Act is proclaimed in 1993.

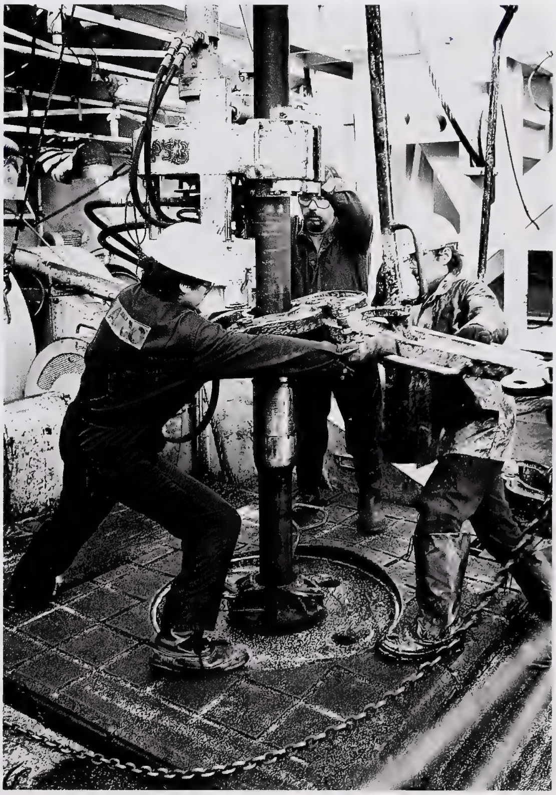
ERCB retains responsibility for upstream oilfield waste

Another outcome of work on the new legislation prompted Alberta's Department of Environmental Protection to confirm continued ERCB responsibility for upstream oilfield wastes.

In addition to clarifying ERCB regulations in this area, numerous industry/government committees were working during 1992 to prepare the following waste guidelines:

- disposal of oilfield sludges and filters, and their incineration
- classification of deep disposal wells for oilfield wastes
- classification of oilfield wastes
- standards and enforcement for disposing of oilfield wastes
- tracking of oilfield wastes
- application procedures for oilfield waste disposal and processing facilities.

This work will continue in 1993. ■



REGULATING UPSTREAM OILFIELD WASTE FROM DRILLING AND SERVICING OPERATIONS WILL CONTINUE TO BE AN ERCB RESPONSIBILITY UNDER NEW ENVIRONMENTAL LEGISLATION.

Almost 400 head office staff gathered to bid farewell to long-time Chairman Gerry DeSorcy.

EFFICIENT, EFFECTIVE AND TIMELY

ERCB vision results in:

- people who are dedicated, creative and well-motivated, and willing to share responsibility for a rewarding and satisfying work environment.

ERCB OPERATIONS

STAFFING AND EXPENDITURES

The ERCB is a technical organization, made up of professionally qualified staff and experienced support people. Staff are located in a downtown Calgary head office, at the Core Research Centre and Chemical Laboratory in Calgary's University Research Park, and in eight area offices around the province. Also, one person is located in Fort McMurray.

During 1992, the ERCB consisted of five Board Members and an Executive Manager—Operations, supported by 663 employees in 17 departments. In May, the ERCB reduced its staff complement by 63 people as a result of a Voluntary Severance Incentive Program. Total staff complement has declined by almost 20 per cent since 1986.

The 1992 budget for ERCB operations was $52 million, down slightly from the previous year. Funding for the oil and gas components of ERCB regulation comes from three sources; a direct allocation from the provincial government (40%), revenues from an administrative levy on operating wells in the province (40%), and sales of data and application fees (20%). Regulatory costs of $2 million involving the coal and hydroelectric industries are paid by the government allocation of the ERCB budget. ■

VAL KWASNY IN ERCB INFORMATION SERVICES CAN PROVIDE A CUSTOMER WITH ACCESS TO ANY ONE OF 140 000 WELL RECORDS.

ERCB Responsibilities

The ERCB is charged with the administration of several Acts that govern Alberta's oil, gas, oil sands, electric energy, coal, pipelines and transmission network. According to the Energy Resources Conservation Act, the Board is required to:

- provide for the appraisal of the reserves and productive capacity of energy resources and energy in Alberta
- provide for the appraisal of the requirements for energy resources and energy in Alberta, and of markets outside Alberta for Alberta's energy resources or energy
- effect the conservation of, and to prevent the waste of, Alberta's energy resources
- control pollution and ensure environmental conservation in the exploration for, and processing, development, and transportation of, energy resources and energy
- secure the observance of safe and efficient practices in the exploration for, and processing, development, and transportation of, Alberta's energy resources
- provide for the recording and timely and useful dissemination of information regarding Alberta's energy resources, and
- provide a source from which the Government of Alberta may receive information, advice and recommendations regarding energy resources and energy.

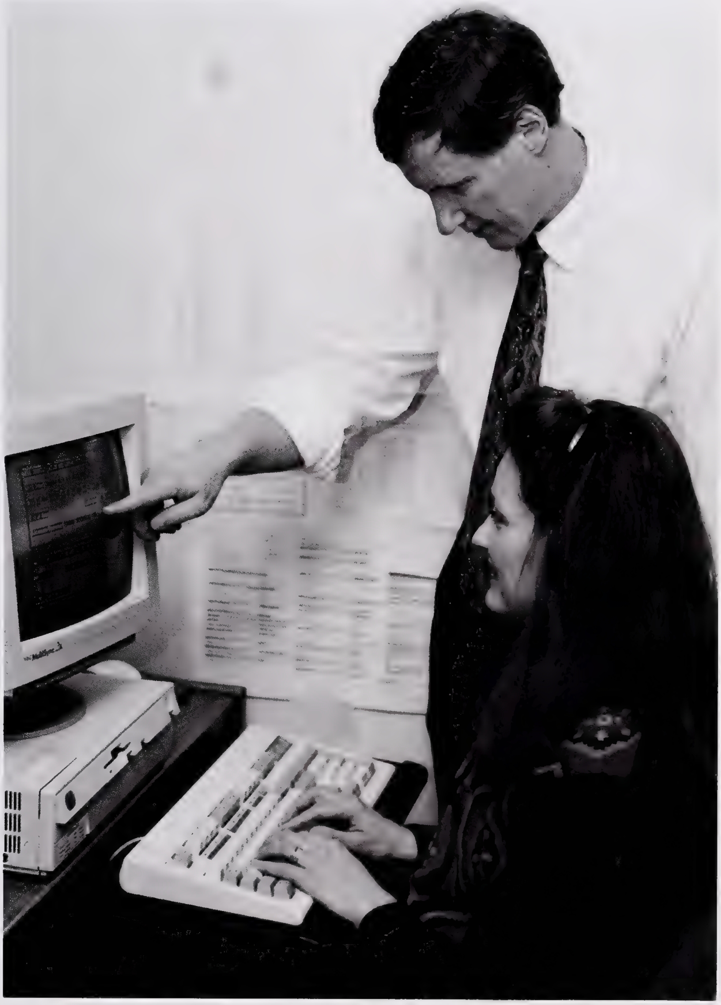
New direction for regulating inactive wells

The ERCB has seen a dramatic increase in the number of inactive wells, from 28 000 in the mid-1980s to 33 000 in 1992. The number increased 5.5 per cent in 1992 alone.

The problem surfaced in a serious way five years ago. Large companies began rationalizing operations, selling off marginally profitable or low-producing wells to small operators. Some operators did not have the resources to sustain operations or properly abandon wells.

The ERCB believed this to be a serious problem that warranted industry-wide solutions. Industry associations have worked closely with the ERCB on an Orphan Well Steering Committee since 1990. The group developed a comprehensive strategy for inactive wells, orphan wells and well licence transfers. An Orphan Well Levy—an annual assessment against inactive wells to provide the ERCB with necessary funds to abandon orphan wells—was initiated in 1992.

In March, the ERCB streamlined internal efforts to more effectively address orphan well issues. During the year, the ERCB coordinated work on 10 orphan wells, four of which were abandoned completely. In addition, planning began for dealing with 22 other orphan wells.



PEGGY REINE AND KEN HUNT ARE WORKING TO REDUCE THE NUMBER OF INACTIVE AND ORPHAN WELLS IN ALBERTA.

The ERCB conducts investigations, holds hearings, and prepares reports relating to energy and energy resources. Staff conduct inspections, performs technical and economic studies, administer conservation policies, authorizations, and regulations on an ongoing basis.

In the area of energy resource data, the ERCB collects, summarizes, evaluates and publishes information. The ERCB's most frequent government interaction occurs with Alberta Energy, Environmental Protection, and divisions formerly in Forestry, Lands and Wildlife.

ERCB ACTIVITIES IN 1992

Application Review Process

- the ERCB reviewed almost 12 000 registered applications in 1992, including 4150 to drill wells, 4800 to install pipelines, 320 related to gas plants, 350 permits to export natural gas, 49 electric projects, 29 oil sands facilities and more than a thousand for other energy-related purposes
- only 12 applications resulted in hearings in 1992, down from 24 last year, and from more than 80 per year in the mid-1980s, largely the result of better mediation efforts by industry and ERCB staff.

CORE RESEARCH CENTRE CELEBRATES 30TH ANNIVERSARY

In November 1992, the ERCB Core Research Centre marked 30 years of service to Alberta's energy sector and to the worldwide geological community.

Home to 1.2 million metres of core and 10 million drill cuttings samples, today's modern Centre came from a humble beginning. Prior to the formation of the first centralized core repository in 1962, core submitted to the Board was stored in crude sheds in southeast Calgary. Hardy research geologists of the day worked with a naked light bulb hung from the ceiling, a wood stove, and a ladder to retrieve core in wooden racks. In winter, one of the greatest difficulties facing researchers was how to keep acid from freezing to core samples.

In 1960, the Alberta Society of Petroleum Geologists asked the provincial government that all Alberta core be stored and controlled by the Conservation Board. The proposal was supported soon after by the province's producer associations.

When Alberta's Core Storage Centre opened in 1962 in northwest Calgary, it was state-of-the-art. A generous 3500 square metres in size, the facility boasted 16 roller-bed tables for viewing core, 28 cubicles for studying cuttings, and staff to serve patrons.

Over the years, the Centre underwent four extensions to the original building. The largest expansion occurred in 1983 when the Centre reached its present size of 18 000 square metres, making it the largest such facility in the world. At that time, it was also renamed the Core Research Centre.

As part of the ERCB Geology Department, the Centre attracts international interest. As many as 700 visitors tour the facility each year, many with a view to how they can create a similar facility in their own countries.

CORE HANDLER, MARK PONTO, RETRIEVES ONE OF 910 000 BOXES OF CORE STORED AT ERCB'S WORLD-RENOWNED CORE RESEARCH CENTRE IN NORTHWEST CALGARY.

ERCB SENIOR TECHNICIAN, SHANE RICHARDSON (CENTRE) MEDIATES THE LOCATION OF A WELL SITE BETWEEN A LANDOWNER AND COMPANY REPRESENTATIVE.

Legislation/Regulation

- the work of the ERCB is governed by eight Provincial Acts and numerous regulations
- new or additional requirements—not yet in ERCB legislation—are set out in a total of 180 current Informational Letters (ILs) and Interim Directives (IDs)
- the ERCB published 22 new ILs and IDs in 1992

Advice to Government

- ERCB regulations affect or are affected by the legislation of many government departments and agencies, most notably Alberta Environmental Protection and Alberta Energy
- these linkages require that ERCB people serve on numerous committees and special projects that originate with government
- applications for energy developments that must be reviewed by other government departments are handled by the ERCB's "one-window" system; that is, the ERCB serves as a collection point for all government permits
- the ERCB also offers a single point for the general public to express concerns about energy projects.

Data Acquisition and Dissemination

- the ERCB has the largest inventory of raw energy resource data in the world, most of it accessible to the public
- the ERCB Library handles about 15 000 service requests annually, 65 per cent of which originate from outside the organization
- ERCB's Information Services houses 140 000 well records and more than 100 regulatory publications and maps
- ERCB's Core Research Centre stores drill cuttings representing almost 44 million meters of drilled interval; core samples represent 1.2 million metres of drilling depth
- 20 000 visitors toured the Energeum—the ERCB's energy science centre—in 1992, half of them as part of organized educational programs.

Resource and Market Appraisal

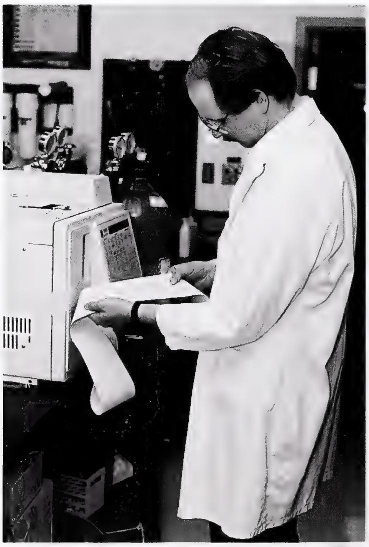
- the ERCB's evaluation of reserves—related to 23 500 gas pools, 7000 oil pools, oil sands deposits and 239 coal deposits—is crucial in determining broad economic policy and industry investment decisions
- the ERCB regularly reports on trends in requirements for Alberta's energy resources.

Responding to Complaints and Concerns

- public complaints are a top priority for field staff; ERCB field inspectors responded to 700 complaints from landowners, residents and special interest groups in 1992
- by year-end, field staff completed 100 formal presentations and 700 visits to residents to explain the role of the ERCB
- the number of applications that result in hearings has decreased dramatically in the past five years, mostly because of efforts by industry and ERCB people to mediate with landowners with concerns.

Inspections and Enforcement

- field staff made more than 20 000 site inspections during the year, including drilling and service rigs, oil and gas wells, gas plants, pipelines, and oil batteries.



TECHNOLOGISTS IRENE ZABORSKI (TOP), JOANNE WOWK (MIDDLE), AND KEN BANISTER (BOTTOM) WORK ON SOME OF THE 540 SAMPLE TESTS CONDUCTED IN 1992 AT THE ERCB CHEMICAL LABORATORY.

ERCB MANAGEMENT TEAM

Board Members

F. J. Mink Vice Chairman
J. P. Prince Vice Chairman
N. G. Berndtsson
B. F. Bietz
R. G. Evans

Executive Manager—Operations

J. D. Dilay

Departments

Accounting R. T. Bording
Administrative Services K. G. Pippard
Coal R. G. Paterson
Communications L. D. Fredlund (Acting)
Drilling and Production J. R. Nichol
Economics J. W. Newton
Employee Relations R. F. Braun
Environment Protection H. O. Lillo
Field Operations W. G. Remmer
Gas H. R. Keushnig
Geology C. A. Langlo
Hydro and Electric T. F. Homeniuk
Information Systems & Technology L. D. Fredlund
Legal M. J. Bruni
Oil R. A. Purvis
Oil Sands R. N. Houlihan
Pipeline K. G. Sharp
Continuous Improvement Coordinator W. J. Schnitzler

DURING 1992, THE ENERGY RESOURCES CONSERVATION BOARD WAS MADE UP OF (STANDING L-R) DR. BRIAN BIETZ (MEMBER), MR. FRANK MINK (VICE CHAIRMAN), MR. GUY BERNDTSSON (MEMBER), (SEATED) MR. RALPH EVANS (MEMBER) AND DR. PHIL PRINCE (VICE CHAIRMAN).

Graphics'
Todd Lindsey
and Loreen Froese
update energy resource
base map.

QUALITY SERVICE

The ERCB is an effective, accessible and respected organization that meets its customers' changing needs by providing quality products and services including regulations, standards, decisions, information, monitoring, enforcement and advice.

1992 PUBLICATIONS FROM THE ERCB

Each year, the ERCB collects and publishes large quantities of raw data and information about energy developments in the province. Much of this material is technical and relates to matters such as geological formations, well data, equipment specifications, and regulations governing industry practices.

In addition, the ERCB publishes material such as guides, decision reports, maps, studies, and brochures that may be helpful to anyone interested in a specific energy project or in learning more about Alberta's energy resources.

To better fulfil the ERCB's legislated information mandate, *Energy Alberta 1992* for the first time brings together a list of all 1992 publications from the ERCB.

Titles are listed alphabetically by topic.

For copies of any of these publications, please contact

ERCB Information Services
640 Fifth Avenue S.W.
Calgary, Alberta
T2P 3G4
Telephone: (403) 297-8190

For a complete list of ERCB publications, please refer to Guide G-1 1993 Catalogue of ERCB Publications, Maps and Services.

*Publication listings followed by a * are free of charge.*

Glossary of Abbreviations

GB= General Bulletin
- a general ERCB announcement

IL= Informational Letter
- an ERCB policy statement

ID= Interim Directive
- an ERCB statement of new or altered requirements that have legal force, but are not yet incorporated into official regulations

G= Guide
- includes ERCB guides, manuals, and handbooks

ST= Statistical Report
- a serial report issued on a regular basis and primarily statistical in nature

ERCB +year+letter (e.g. ERCB 92-A)
- a technical report issued once.

Special Report

92-A Ultimate Potential and Supply of Natural Gas in Alberta

A major ERCB technical and geological report indicating the future of natural gas supply in terms of economics, potential areas for development in the province, and forecasts for demand and supply. (For more information on this report, see story on page 32)

EXAMINING CORE. ALBERTA'S EXTENSIVE GEOLOGICAL DATA IS CRUCIAL TO ERCB AND INDUSTRY APPRAISAL OF RESERVES.

Coal

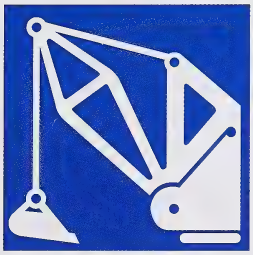
Significant Coal-Bearing Formations in Alberta

Map showing coal fields and deposits in Alberta.

ST 92-29

Alberta Coal Industry Annual Statistics—1991

Contains monthly coal industry statistics for 1991, as well as annual statistics from 1982 through 1991.



ST 92-31

Reserves of Coal Province of Alberta—1991

Identifies coal fields, coal deposits, and coal occurrences designated for Alberta. Includes detailed tabulation of established reserves by field and deposit, as well as reserves within mine permit boundaries.

Electricity

D 91-12

The City of Edmonton (Edmonton Power) Application 910336 Review of the Commissioning Date of Genesee Unit No. 1

Edmonton Power submitted an application to the ERCB to amend an approval to allow construction to resume on the Genesee plant for completion by November 1993. This report discusses future electric energy requirements and the adequacy of existing sources, as well as the costs and benefits of alternative commissioning dates of the Genesee unit.

ST 92-28

Alberta Electric Industry Annual Statistics Province of Alberta—1991

A compilation of electric industry annual statistics, including major power plant capacity and generation, industrial on-site generating capacity and generation, stack emissions from thermal generating plants, small power sources, electric energy consumption, and transmission lines. Map included.

Environmental Protection

GB 92-10*

Criteria For Disposal of Oily Waste to Roads

Lists characterization criteria for the storage, handling and disposal of oily wastes.

ID 92-2*

Noise Control Directive

Outlines step-by-step approach for companies in controlling noise levels from energy facilities.

IL 92-12*

Guidelines for Minimizing Disturbance on Native Prairie Areas

Guidelines for energy facility operators working in native prairie areas.

General Publications

92-40

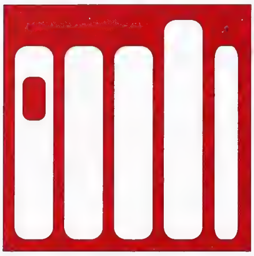
Energy Alberta 1991*

Annual review of Alberta's energy sector and ERCB regulatory initiatives.

ID 92-5

Application Fees*

The ERCB announced an increase in application fees because of increased operating and processing costs in keeping with a user-pay policy.



Geology

Core Research Centre*

Booklet showing core and drill cuttings storage, research areas and service facilities of the ERCB Core Research Centre located in Calgary's University Research Park.

G-14

PVT and Core Studies Index

A revised index of pressure, volume and temperature analyses, special PVT studies and special core studies.

G-21*

Standards for the Submission of Digital Log Data to the ERCB

This report contains general information data to be captured, data format, and deficiencies of digital log data.

GB 92-12*

Logging Requirements

Highlights regulation changes and format requirements for the submission of digital well-log data.

Geology Maps of Alberta Base of Fish Scales

Twenty-four maps include selective surface hydrographic features, erosional edge of base of Fish Scales, selective structural features relative to the contour levels, and contour intervals that honour subsurface well locations and values.

Table of Formations, Alberta

Report contains six geographic areas of Alberta, the stratigraphic relationships between these areas, and identifies resource occurrences.

Natural Gas (INCLUDING SOUR GAS)

Alberta Gas Strike Areas

Map showing ERCB's official area designations for natural gas.

GB 92-4 *

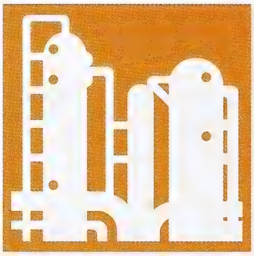
Requirements For Sulphur Storage Facilities

This bulletin emphasizes ERCB policy and requirements for sulphur storage in Alberta because of current soft demand and transportation difficulties in the sulphur industry.

GB 92-13*

Monthly Custom Treating Plant Statement ERCB Form S-24

After gaining experience in processing the revised S-24 form, the ERCB announces modifications to the form's format and content based on industry suggestions.



IL 92-6*

Gas Well Testing Provincial Program of Subsurface Pressure Surveys for Gas Pools

As part of new regulatory policies for testing oil and gas wells, the ERCB announced it would no longer issue a general bulletin outlining the provincial program of subsurface pressure surveys for gas pools.

Memorandum of Decision*

Outlines how the ERCB will proceed on Canadian Occidental Petroleum Ltd.'s application for well licences for two wells southeast of Calgary.

Northeast Calgary Application Consultation Committee (NCACC)*

A series of five reports with recommendations to the ERCB that resulted from a major public consultation program concerning potential sour gas development adjacent to northeast Calgary communities.

ST 92-35

Alberta's Reserves of Gas —1991

A complete listing of Alberta reserves of gas that expands on data reported in ST 92-18.

Technical study of shelter versus evacuation when faced with a release of hydrogen sulphide*

Provides results of computer modelling showing that staying indoors—instead of evacuating through a hydrogen sulphide plume—could be a safe alternative for people exposed to an accidental release of sour gas.

Oil

GB 92-5*

Summary of 1991 Crude Oil Reserve Changes

Summarizes new oil pools, revises reserves in existing pools, and approves various schemes for improving ultimate oil recovery.

ID 92-4*

Horizontal Oil Wells Licensing, Spacing and Production Rate Limitations

The ERCB removed administrative obstacles facing horizontal wells that penetrate laterally adjoining drilling spacing units. In addition, this directive outlined measures to streamline applications and ease production restrictions while protecting the environment, resource conservation and correlative rights.

IL 92-4*

Good Production Practice Conventional Crude Oil Pools

To streamline administration of oil pool allowables, the ERCB identified 230 pools that no longer required production rate controls because they were under primary depletion. These wells were placed on good production practice (GPP) status.

IL 92-5*

Reduced Fluid Sampling and Analysis Requirements for Hydrocarbon Miscible Flood Schemes

Summary of changes to, and implementation of, ERCB policy as a result of sampling and analysis practices for hydrocarbon miscible flood schemes.

IL 92-8*

Crude Oil Pipeline Truck Terminal Measurement Guidelines

Practices and procedures for ensuring the quality of measuring crude oil being trucked to pipeline terminals. The measurements are important for industry revenues, and to satisfy engineering, equity, and royalty requirements.

IL 92-9*

Revised Reporting Procedures— Load Fluids

The ERCB clarified definitions of load fluid and load oil as follow-up to a major revision to how companies report production, injection, and disposition of oil and gas.

Oil and Gas (INCLUDES FACILITIES)

GB 92-7*

Meter Proving Monitoring Program Results Summary—1991

Shows the level of satisfactory versus unsatisfactory results of random monitoring of oil meters for 18 meter-proving companies. The bulletin also announced the ERCB's intention to place emphasis on companies with a history of performance problems.

GB 92-8*

Primary Standard for Gauges Used to Calibrate Surface Pressure Devices

ERCB announced that the standard primary standard dead-weight gauge in Alberta would continue to be maintained by the ERCB.

GB 92-9*

Shop Servicing and Testing of Blowout Preventers and Flexible Bleed-Off and Kill-Line Hoses—

Extension of Certification Period

The ERCB and industry announced it would review sections of the regulations dealing with flexible bleed-off and kill-line hoses. As changes occur, the ERCB would extend all existing certification expiry dates to 31 December 1992.

GB 92-15*

Winter Drilling and Servicing Operations

Reminder that all drilling and servicing equipment must be properly winterized prior to the arrival of cold weather.

Guide G-46

Production Audit Handbook

Included detailed checklist and procedures used by ERCB staff when conducting production audits of oil facilities.

ID 92-1*

Drilling Blowout Prevention Requirements Modification

After concerns were revealed about the overall level of kick occurrences and an increase in serious well control incidents at shallow wells, the ERCB introduced modifications to the existing blowout prevention requirements.

ID 92-3*

S-1 and S-2 Electronic Data Submission

ERCB requested industry to submit certain production data by electronic media to increase efficiency.

IL 92-2*

Well Ownership/Working Interest Ownership—Submission Requirements

Because working interest owners are responsible for well-abandonment procedures, the ERCB will collect ownership information at the following stages in the life of a well: licensing, transfer of well licence, suspension and abandonment.

IL 92-10*

Orphan Well Fund—

1992 Orphan Well Levy

Announcement that 1991 orphan well-abandonment expenses would be recovered through a levy against inactive wells. An inactive well is any well which recorded twelve consecutive months of no production or injection in the 1991 calendar year.

IL 92-13*

Well-Name Requirements

The ERCB announced regulatory amendments that will simplify ERCB requirements for changes in well names.

IL 92-14*

Issuing of ERCB Battery Codes

The ERCB stipulated how operators may obtain battery codes within 24 hours.

Alberta Oil and Gas Industry Annual Statistics—1991

This publication summarized information on oil and gas activity for 1991, including monthly production, inventories and deliveries.

ST 92-18

Alberta's Reserves of Crude Oil, Oil Sands, Gas, Natural Gas Liquids, and Sulphur—1991

Contains maps and data on various types of reserves, drilling trends, and reserves terminology and abbreviations.

Oil Sands

IL 92-11*

Experimental Schemes—Release of Information

In this letter, the ERCB specifies shorter confidentiality periods for some experimental schemes to avoid duplication of approvals.

ST 92-43

Alberta's Oil Sands Annual Statistics

This publication contains information on Suncor and Syncrude Oil Sands Plants' production and processing for 1967-1991 as well as inventories, production, deliveries, and other uses of synthetic crude oil, coke, sulphur, bitumen and distillate.

ST 92-53

Alberta Crude Bitumen Production—Monthly Statistics

Contains monthly update of crude bitumen production volumes from commercial and experimental schemes.

Pipelines

91-G

Performance in Alberta

This study analyzes ERCB data on the causes and magnitude of pipeline failures from 1980-1990, showing trends in various types of leaks and ruptures.

D 91-6

Addendum

Applications by the Imperial Pipe Line Company Limited/Esso Resources (1989) Limited To Change Substance in the Edmonton To Sundre Pipeline From Blended Bitumen to Natural Gas and For Associated Pipeline Facilities and Connections Application by Northwestern Utilities Limited To Reconsider Approval of Federated Pipe Lines Limited Natural Gas Liquids Pipeline

This report deals with the Board's decision on a number of related applications to reconfigure pipelines in southern Alberta.

D 91-15

Application By Bow River Pipe Lines Ltd. To Construct a Pipeline and Pumping Facilities in Southern Alberta

This decision report discusses an application to construct a crude oil pipeline and related facilities in southern Alberta.

D 92-1

Signalta Resources Limited

Application 910454 Common Carrier in Sugden Field

The company applied to make Amoco Canada Petroleum Company, Limited a common carrier. This report deals with geological matters, the need for a common carrier, and details of the common carrier order.

D 92-3

Application by Federated Pipe Lines Ltd. To Construct a Pipeline and Related Facilities From Acheson to Fort Saskatchewan

This decision report deals with Federated's application to construct a high vapour pressure products pipeline from Acheson to Fort Saskatchewan.

IL 92-3*

Pipeline Excavation Procedures

Clarified ERCB regulations on excavation near pipelines that were shown to be difficult to comply with under certain circumstances.

Proceeding 911586*

Call for Information

Altamont Gas Transmission Company and Pacific Gas Transmission Company Proposals for Pipelines to California

Report summarized ERCB findings on proposals by Altamont and Pacific Gas Transmission for two major pipelines to move Alberta gas to U.S. markets primarily in California. (See also story on page 32.)

DATA SOURCES FOR GRAPHS IN ENERGY ALBERTA 1992

The following publications and agencies provided statistics that resulted in the graphs on pages 18-27.

ALBERTA HYDROCARBON ENERGY RESOURCES — 5-YEAR PRODUCTION

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

ERCB ST-29

Alberta Coal Industry Annual Statistics

OIL PRODUCTION AND RESERVES CHANGES

ERCB ST-17 (production)

Alberta Oil and Gas Industry Annual Statistics

ERCB ST-18 (reserves)

Alberta's Reserves of Crude Oil, Oil Sands, Gas, Natural Gas Liquids, and Sulphur

MARKETS FOR OIL

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

OIL AND GAS WELLS — EXPLORATION

OIL AND GAS WELLS — DEVELOPMENT

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

GAS PRODUCTION AND RESERVES CHANGES

ERCB ST-17 (production)

Alberta Oil and Gas Industry Annual Statistics (reserves)

ERCB ST-18

Alberta's Reserves of Crude Oil, Oil Sands, Gas, Natural Gas Liquids, and Sulphur (reserves)

NATURAL GAS LIQUIDS PRODUCTION

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

MARKETS FOR GAS

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

SULPHUR PRODUCTION

MARKETS FOR SULPHUR

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

BITUMEN AND SYNTHETIC CRUDE OIL PRODUCTION

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

COAL PRODUCTION AND RESERVES CHANGES

ERCB ST-29

Alberta Coal Industry Annual Statistics

ERCB ST-31

Reserves of Coal, Province of Alberta

MARKETS FOR COAL

ERCB ST-29

Alberta Coal Industry Annual Statistics

ELECTRICITY GENERATED

GENERATING CAPACITY FOR ELECTRICITY

MARKETS FOR ELECTRICITY

ERCB ST-28

Alberta Electric Energy Annual Statistics

ENERGY RESOURCES USED TO MEET ALBERTA'S END-USE REQUIREMENTS 1992

1992 END-USE REQUIREMENTS IN ALBERTA

ERCB 91-A

Energy Requirements in Alberta 1991-2005

GROSS REVENUES — ALL HYDROCARBONS

ERCB Economics Department prepared this graph from a variety of sources that include average prices multiplied by volumes for each resource.

ALBERTA AVERAGE WEIGHTED FIELD PRICE FOR LIGHT OIL

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

ALBERTA AVERAGE MARKET PRICE FOR GAS

ERCB ST-17

Alberta Oil and Gas Industry Annual Statistics

ENERGY INVESTMENT IN ALBERTA

Statistics Canada SC 61-216

ALBERTA'S ENERGY RESOURCES — A SUMMARY

A number of sources were meshed to create this summary chart:

- Canadian Association of Petroleum Producers Annual Statistics on Canadian reserves of oil and gas
- ERCB ST-18, Alberta's Reserves of Crude Oil, Oil Sands, Gas, Natural Gas Liquids, and Sulphur
- ERCB ST-17 Alberta Oil and Gas Industry Annual Statistics
- estimates of Canadian reserves of coal provided by the Geological Survey of Canada
- ERCB ST-31, Reserves of Coal, Province of Alberta
- Alberta energy sales come from ERCB ST-17, Alberta Oil and Gas Industry Annual Statistics
- sources for Canadian production of energy come from Statistics Canada documents 26-002 (oil and gas), 45-002 (coal) and 57-001 (hydro)

Time of Transition

ERCB

Energy Resources
Conservation Board

INTO *the* NEXT CENTURY

You may know that the ERCB...	But did you know that the ERCB...
• has been in existence for many years	• has been regulating Alberta's energy industry since 1938?
• regulates the oil and gas industry	• is also the key provincial regulator of oil sands, pipelines, coal and electric energy? • keeps track of Alberta's growing inventory of 500 000 energy facilities and 220 000 kilometres of pipelines?
• holds hearings on major energy proposals	• makes decisions on more than 99 per cent of energy proposals without objections from affected parties and the need for a hearing? • is an independent, quasi-judicial board that ensures fairness to all those affected by energy resource development? • has a record dating back to the 1940s of exercising its environmental mandate to prevent waste and pollution? • acts as the single window for coordinating almost all government approvals on new or expanded energy facilities?
• is a provincial government agency with headquarters in Calgary	• receives half of its funding from a compulsory levy (tax) on oil and gas production? • operates a head office, core research centre, chemical laboratory and visitor centre in Calgary, plus eight field offices throughout Alberta? • has been studied and emulated by other countries as a model for regulation of state-owned resources in a free enterprise economy?
• is a technical organization with engineers and geologists	• employs inspectors, technical specialists, support staff, economists, lawyers, accountants, biologists, agrologists and computer analysts?
• collects and provides data on the province's energy resources and facilities	• maintains a world-class and publicly accessible energy database that has fostered the growth of hundreds of small oil and gas companies and dramatically improved their chances of finding petroleum?

THE ERCB *in* TRANSITION

Whether or not you have had dealings with the ERCB, you may be aware of only part of what this organization has been doing for more than 50 years. This publication offers broader insight into our role by describing less-well-known things we do every day—things that benefit Albertans directly and indirectly.

We also want to tell the story of how we are changing in step with industry, government and the public. The transformation of the oil and gas industry is part of the drive to new regulatory approaches at the ERCB. The large geological basin underlying Alberta is now relatively mature in terms of petroleum exploration. This, and more modest expectations about world oil prices, has altered corporate strategies.

Likewise, the coal sector is changing as it faces greater environmental challenges. Large coal projects are attracting the interest of federal regulators. Industry and the ERCB are learning to deal with joint review procedures. Alberta's electrical system is also involved in new regulatory problems as utilities increasingly incorporate the potential for cogeneration and small power production.

Industry is not alone in facing change. From government's perspective, long-term budget constraint is forcing all public service organizations—including the ERCB—to scrutinize operations and find more efficient and effective means to deliver their services.

Meanwhile, the public has increasing expectations for enhanced environmental protection and active involvement in development decisions.

Another important facet of ERCB responsibility is Alberta's growing energy industry infrastructure. For us, this means dedicating more effort to inspecting and monitoring suspended, aging and expanding facilities.

This publication highlights ERCB efforts to respond to change on many fronts. Most significant is our renewed emphasis on streamlining and continuous improvement. Our goal is to systematically improve the efficiency and effectiveness of every ERCB function. ■

"The ERCB is under a lot of pressure these days from a lot of interest groups. The ERCB's challenge will be to know when to resist change and when to accept it. Those who pressure the ERCB to change should remember that much of its strength derives from the fact that it has been allowed to function for over 50 years with a minimum of outside interference. The Board, on the other hand, must recognize that its authority to regulate and adjudicate is derived as much from the people its decisions affect as it is from its enabling legislation."

Brian O'Ferrall
Lawyer
Bennett Jones Verchere
Calgary

WHAT WE MEAN BY CONSERVATION

A major responsibility of the ERCB is to regulate the province's energy industry to optimize resource recovery. Most people understand conservation to mean careful use of energy by consumers. This is important, but the ERCB's mandate is to ensure that Alberta's energy resources are developed with minimal waste. So, the ERCB's conservation focus is on the efficient **production and processing** of energy resources.

WHAT WE MEAN BY THE PUBLIC INTEREST

A major component of the Board's responsibility is to ensure that when energy development occurs, it does so in a manner which optimizes the benefits to the Alberta public. At the same time, development must minimize negative effects on the environment, social values and way of life of Albertans.

50+ YEARS *of* ERCB SERVICE

1938. Turner Valley. Two decades' worth of wasting huge amounts of natural gas reduces the underground pressure that pushes oil to the surface. The potential of this rich oilfield is forever compromised by poor production methods. The problem is largely due to companies failing to apply geological knowledge and engineering principles that would later maximize recovery in other oil and gas pools.

These circumstances convince industry and government to accept provincial supervision of oilfield production and development in the public interest. And so the Conservation Board becomes a reality on 1 July 1938.

1947. Leduc. This major oil discovery signals the transformation of Alberta's fledgling petroleum sector into a major national industry with continental markets.

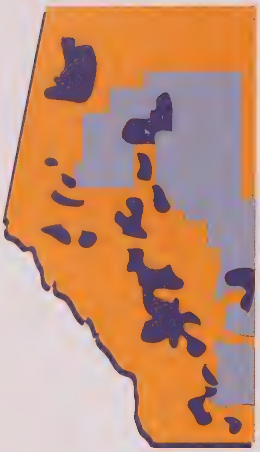
For the Board, the discovery means more complex regulatory challenges. Among them is the Board's sophisticated and sensitive approach to controlled and equitable production of petroleum in an era of chronic oversupply.

The post-Leduc period also sees the rapid expansion of Board field offices. The result is a strong inspection team able to translate theoretical expertise into practical and reasonable enforcement in the field.

1971. Expanded responsibilities. At the beginning of a decade of economic boom, legislation extends the Board's regulatory authority to coal, the generation and transmission of electricity, and pipelines.

The Board's increased responsibilities coincide with growing public concern about pollution from industrial development. The Board's response is to place more emphasis on environmental protection without fundamentally changing its legislated mandate. As a case in point, in 1971 the Board and the new Department of Environment issue province-wide sulphur recovery guidelines to reduce harmful emissions from large gas plants. These environmentally focused guidelines are built on requirements that have been in effect for conservation reasons since the 1950s.

1981. Growth. Energy sector expansion allows Alberta's economy to grow and diversify. In many ways the aims of the energy sector during this time are at odds with changing public values and expectations for improved lifestyles and environmental protection. Tension grows over land use and compensation issues related to new energy projects. The



ALBERTA OIL, HEAVY OIL AND OIL SANDS DEPOSITS

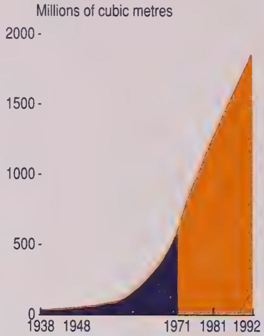
Alberta has 30 000 active oil wells and 12 500 production batteries.

Each year, companies conserve about 20 billion cubic feet of solution gas that is produced with oil. Solution gas accounts for 16% of total gas production.

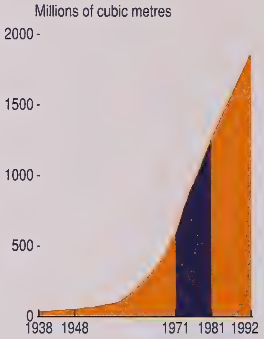
About 50 enhanced oil recovery schemes resulted in over 100 000 barrels of additional production in 1992.

Mining operations at Suncor and Syncrude move 490 000 tonnes of oil sands every day.

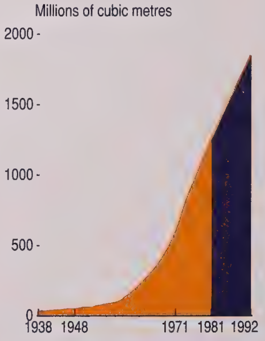
CUMULATIVE OIL PRODUCTION
1938 - 1971



CUMULATIVE OIL PRODUCTION
1971 - 1981



CUMULATIVE OIL PRODUCTION
1981 - 1992



"…by the late 1950s…the Conservation Board had passed beyond relying on past U.S. experience. From an established tradition of a strong field presence, and an emphasis upon data collection and its own developing technical expertise, the Board moved on to conservation initiatives of its own. This was of great importance because the foundation that was being built in Turner Valley and during the first decade of the post-Leduc oil boom would largely determine the manner in which the petroleum industry in Alberta would function as it moved into its mature phase.

The impact of the Board's presence is even more far-reaching.…This is because its influence extended well beyond the conservation mandate assigned by the conservation acts. Almost from the moment it was created, the Board was called upon by the government for information and advice on petroleum policy."

Dr. David H. Breen
Alberta's Petroleum History and the Conservation Board
1993

Board champions alternative means for dispute resolution such as public consultation and mediation.

In the evolution of its mandate, the Board's quest for regulatory fairness comes to mean balancing environmental and social values with economic issues to achieve decisions in the public interest.

1992. Recovery. After the boom years of the early 1980s, the petroleum industry suffers five years of constraint imposed by lower prices and demand for its products. Industry focuses on streamlining and rationalizing activities. By 1992, recovery appears to be under way.

ERCB staff levels peak in 1985. During the next seven years, the Board quietly reduces staff by 20 per cent. Streamlining efforts are complicated by the fact that industry rationalization has created many new small companies that are less experienced in meeting regulations. Such operators require more attention from ERCB staff. Demands on the organization increase.

The Board responds by adopting a total quality management program. The approach seeks involvement from staff, public, government and industry to ensure the Board is doing the job right and is also doing the right job. This common-sense strategy promises to reduce regulatory activity in ways that are acceptable and beneficial to customers.

The future. Financial restraint continues. The ERCB looks to staff and customers to reassess what it does. The goal is to eliminate low-priority activities and to ensure no increased risk to public safety or the environment from declining budgets and more industry players. The Board continues to respond with reason, fairness and competence to new realities. ■

"To our minds, conservation and development decisions had to be made on engineering factors only, not on political factors.

The ground rules for the new Board were: first, get the maximum production possible and encourage investment and development; second, get a fair return for the public, as owners of the resource; and third, eliminate waste.…Those ground rules are as appropriate today as they were in 1938."

Ernest Manning
Alberta Minister of Trade and Industry in 1938,
interviewed in 1987 for the 50th anniversary of the ERCB

THE ERCB TODAY—SERVICE *to* ALBERTANS

ALBERTA GAS DEPOSITS

Alberta has 642 gas processing plants with capacity to process 856 million cubic metres per day of raw gas, drawn from 34 000 active gas wells across the province.

Alberta's annual production of 5.7 million tonnes of sulphur accounts for about 45% of world trade in this by-product of the province's 60 sour gas and two oil sands plants.

During our long history, the ERCB has created a broad base of functions to further our mandate to serve the public interest. A number of core services flow from this base.

APPLICATIONS AND PUBLIC HEARINGS

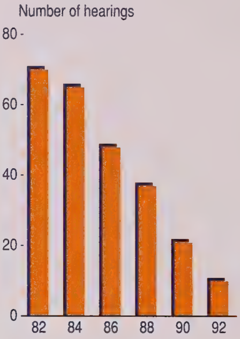
Energy projects that have the potential to affect the public interest must gain ERCB approval. Our regulations require companies to file thousands of applications each year. The Board acts as a control point to ensure public awareness of proposed developments. We check that a developer has thought through a project thoroughly from an economic, technical and environmental perspective. In addition, our role means important information about province-wide energy development is captured for future decision-making.

Some applications result in public hearings, usually when landowners or operators oppose a company's application. This may occur even after discussion of issues and exchange of information. A hearing provides an efficient way of airing concerns and reaching a fair decision. Information-sharing is required of all those involved in a hearing, and each side has an opportunity to question everyone else's position.

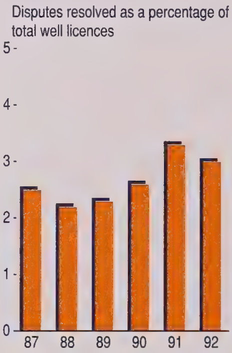
Since its inception, the ERCB has tried to improve how it reaches decisions, especially for major energy proposals or those with high public concern. ***We have tried to make decisions by weighing positions before us objectively and by balancing various components of the public interest.***

As fair as they are, public hearings can lead to dissatisfaction. Our experience has shown that companies that consult early with communities and government pave the way for better regulatory decisions. We now promote mediation as a way of addressing concerns proactively and reducing the number of hearings.

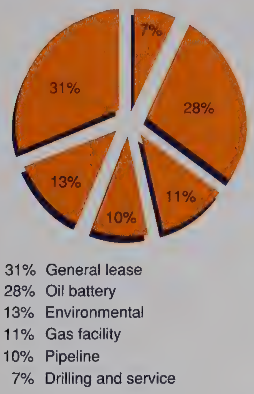
BOARD HEARINGS



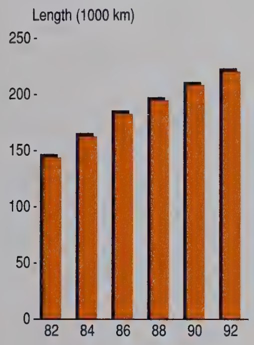
MEDIATION OF LANDOWNER DISPUTES



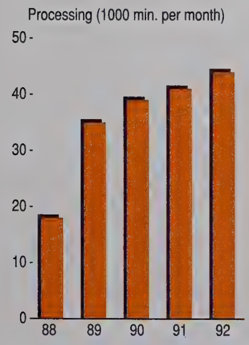
INSPECTIONS BY TYPE - 1992



LENGTH OF PIPELINES UNDER ERCB JURISDICTION



ERCB COMPUTER DEMAND



FACILITY INSPECTION AND ENFORCEMENT

Active enforcement has always been key to the ERCB's regulatory effectiveness. Our standards for operating energy facilities result in more than 25 000 annual inspections by field staff in our eight area offices.

But how to cope with Alberta's growing inventory of production, transportation and processing facilities?

Alberta's energy facilities operate with an enviable record of safety and environmental protection. To ensure this remains the case, our approach has changed in recent years to focus on areas of high concern. Where industry operators are less experienced or have a history of poor operations, ERCB field staff do considerable inspection work. ***On the other hand, companies with superior records of performance receive far less attention from our inspectors.***

INFORMATION IS KEY

Providing information to support good decision-making is a key ERCB service. Industry, government and the public often need different kinds of information, but the information must be reliable.

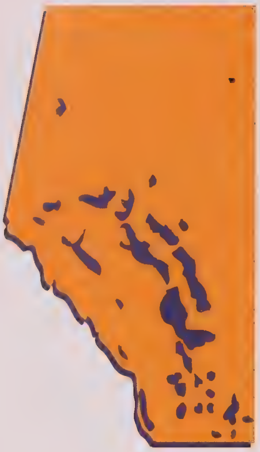
The provincial government draws on our capacity to assemble industry and resource information to address specific issues. Our ability to respond quickly allows government to resolve difficult problems in a timely and well-informed way.

Comprehensive information is also valuable to industry. While larger companies may have the resources to develop and maintain their own information base, ***Alberta's many smaller companies rely on accessible and detailed ERCB data. Many companies have been attracted to Alberta for this reason.*** Reliable information enhances their chances of success in searching for and developing the province's energy resources. ■

ERCB INFORMATION AT A GLANCE

- The ERCB energy resources database—the largest integrated system of its kind in the world—captures 1200 different types of raw data.
- An estimated 11 000 patrons from 300 companies and associations use the Core Research Centre's 1.2 million metres of core and 10 million drill cutting samples each year.
- Some 520 representatives of exploration companies attended recent ERCB presentations on the future gas potential of Alberta.
- Our Information Services Section houses complete records for Alberta's hundreds of thousands of energy projects; staff retrieved 77 000 files in 1992.
- Library staff handled 15 000 service requests in 1992, 65% from outside the ERCB.
- Since the Energeum opened in 1983, more than 250 000 people have toured the visitor centre, half of them in organized school groups.

MORE ERCB SERVICES



ALBERTA COAL DEPOSITS

Alberta produced 57% of Canada's coal in 1992.

Canada ranks fifth in the world in coal exports, most of which come from Alberta and B.C.

In addition to the ERCB's better-known roles are a host of lower-profile services that benefit landowners, communities, energy companies and government decision-makers.

RESPONDING TO ENERGY EMERGENCIES

What the ERCB does

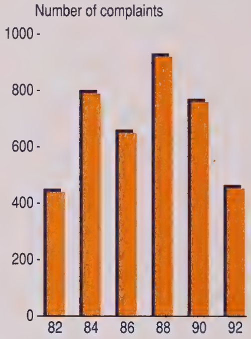
To prevent emergencies, we work closely with industry and government departments to ensure energy facilities operate safely. ***But when incidents occur, our guidelines ensure a proper response.*** An example is the emergency response system for an accidental sour gas release. The response illustrates potentially life-saving regulations that, fortunately, are rarely used.

When a sour gas well has a major problem, the first line of protection is the company's ERCB-approved emergency response plan. The operator springs to action to notify and perhaps evacuate nearby residents. A call to our nearest field office triggers a provincial emergency response team including police, local health and disaster coordinators, public information officers, occupational health and safety experts, and environmental monitoring specialists. Our inspectors monitor on-site conditions and assist company officials to regain control and keep the public safe and informed.

Who benefits?

Our primary objective is to protect public health and safety. Residents who live near facilities can be assured that they will be alerted and protected during an energy emergency.

ENVIRONMENTAL COMPLAINTS



REGULATING ORPHAN WELLS

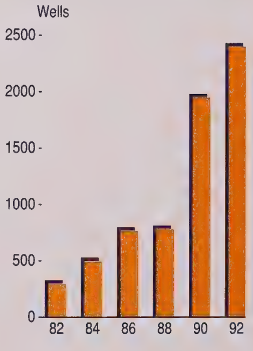
What the ERCB does

The problem of ensuring industry's long-term responsibility for inactive and orphan wells (which have no owners) first surfaced in a serious way in the mid-1980s.

An industry/government committee addressed the issue through new regulations that prevent wells from becoming orphans. The committee also developed a program that allows existing orphan wells to be properly abandoned.

Industry funds the program through an annual assessment levied by the ERCB against inactive wells. We administer the program as part of our regulatory control of a growing infrastructure of aging energy facilities.

CASED WELL ABANDONMENTS



Who benefits?

The most significant beneficiary is the Alberta taxpayer, who is not left to pick up the costs for properly abandoning industry's cast-off wells. Attention to old wells also means landowners do not face environmental or safety hazards from leaking or improperly abandoned wells.

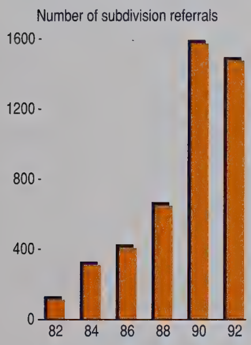
> "After many years of good working relationships, the ERCB has earned our respect and confidence. We rely on the ERCB as the authoritative source of advice and information on energy matters. We could not plan effectively in the Calgary Region without them."
>
> *Ivan Robinson*
> *Executive Director*
> *Calgary Regional*
> *Planning Commission*

PLANNING FOR PEOPLE AND ENERGY FACILITIES

What the ERCB does

As rural and urban communities grow, they often approach energy facilities. Each year, planning authorities ask us for advice on how close new urban development should be to energy facilities to maintain public safety.

SUBDIVISION REFERRALS



Just as we prescribe minimum separation distances for new energy projects, others use our information to ensure new subdivisions or other land-use developments do not encroach on energy facilities.

Who benefits?

All Albertans do. A landmark effort west of Edmonton illustrates the benefits of cooperation based on careful planning. In the early 1980s, oil and gas development and urban growth seemed to be on a collision course. With ERCB intervention, both interests worked together to integrate oil wells, access roads and flow lines into a subdivision plan.

With such successes, residential developers, local authorities and planning commissions have come to rely on our information and advice on land-use matters.

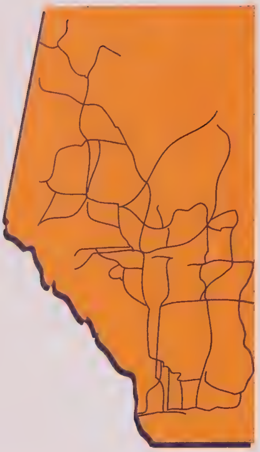
ONE WINDOW FOR GOVERNMENT APPROVALS

What the ERCB does

Applications for major energy facilities often require input and approvals from several government departments. In such cases, we act as a single window for the filing of applications and their review by government departments and the public.

Who benefits?

Industry has gained from the one-window approach because companies do not have to go to each government department for reviews and approvals. In turn, government departments find the system efficient because they do not have to deal with requests from many companies.



ALBERTA ELECTRIC SYSTEM

More than 90% of Alberta's electricity comes from coal-fired plants.

Alberta's utility rates are among the lowest in the industrialized world.

The total length of all transmission/distribution lines in Alberta is 227 000 kilometres.

THE RIGHT TO KNOW

What the ERCB does

As part of thousands of applications each year, the law requires that we inform those who could be "directly or adversely affected".

Each weekday, in newspapers across Alberta, we publish legal notices about proposed energy facilities. The cost of these ads is paid for by the companies involved. For well licences, most applications already have landowner agreement and notices never reach the newspaper. ***For very large projects, whole communities must be informed and consulted—often several times—and their concerns and questions properly addressed.***

Who benefits?

Almost all of our customers reap the rewards of this well-established system of notification. In the legal world, it is called applying the rules of natural justice. To us, it means fair play. Just as a company has the right to the resources underground, so the surface owner has a right to know what is going on and to have a say. ■

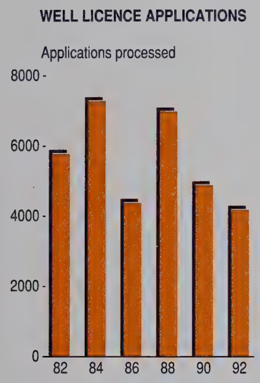
> "The ERCB is not a regulatory body that rubber stamps energy company requests regardless. The ERCB is becoming more sensitive to surface-related issues, soil conservation and the environment. Surface owners should become better informed about this Board and its practices."
>
> *Alban Bugej*
> *Elk Point Surface Rights Association*

STREAMLINING *for* EFFECTIVENESS

Although the 1990s is a time of transition, the ERCB has always adapted to changing circumstances in the energy industry and in Alberta society. As new technology made regulations obsolete, we reviewed and modified them. This ERCB tradition of adaptability continues today.

APPLYING OURSELVES TO APPLICATIONS

What is the ERCB streamlining?



Alberta's energy industries must apply to the ERCB to obtain approvals for new development or changes to operations. Application review is a priority area for streamlining and continuous improvement.

A team—drawn from several of the ERCB's application processing departments—recently looked at three types of applications: industrial development permits, well spacing, and oil batteries/gas plants.

Interviews with staff, industry, government and public groups helped determine the need for each application type and the information required. The aim was to identify key reasons that justify an application. Another objective was to specify precise information needs related to those key reasons. This approach separated necessary information from the nice-to-have.

Early results included an overall reduction in information required for all types of applications and possible elimination of certain types. The team is laying the foundation for a review process for all ERCB applications and regulations.

Who benefits?

The major beneficiary is the energy industry. Streamlining the application process will reduce paperwork and associated staff costs. The ERCB also gains many advantages. By reducing our application workload, staff will be able to devote more time to dealing with increasing demands in other areas.

> "The oil and gas industry has been, and will continue to be, the industry that gives Alberta the opportunity to be an exceptional province. A strong, healthy industry needs a strong and healthy ERCB in order to maintain its competitiveness and deliver benefits to all Albertans."
>
> *Bob Paget*
> *Executive Vice-President*
> *Renaissance Energy Ltd.*

ALBERTA PIPELINE SYSTEM

Laid end to end, Alberta's pipeline network stretches 220 000 kilometres.

It takes 21 days for a barrel of oil to travel by pipeline from Edmonton to southern Ontario.

Alberta's 6000 kilometres of sour gas pipelines must adhere to the strictest standards of construction and operation in the world.

RESPONDING TO TECHNOLOGICAL CHANGE

What is the ERCB streamlining?

A recent development in the oil and gas industry has been horizontal drilling. This technology has created new situations in which existing regulations were no longer effective. We have worked intensively with the oil and gas industry to develop appropriate regulations—an example of how we respond to and accommodate changes in new technology.

Who benefits?

The advantage to the energy industry of appropriate revision of regulations is far-reaching. Meeting ERCB requirements is essential and is a cost of doing business. We strive for regulation that fits the situation—no more, no less.

FOCUSED ENFORCEMENT

What is the ERCB streamlining?

For five years, the ERCB has been reducing inspections of oil and gas operators that have demonstrated long-time adherence to proper practices. This does not mean that we have eliminated our inspection role—only that we are confident the level of supervision can be reduced.

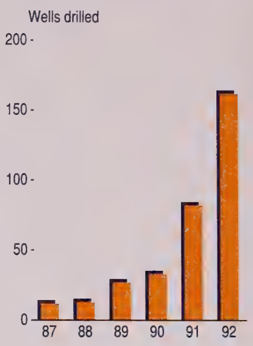
Another ERCB approach to streamlined enforcement is education. We have found that we can achieve large gains in efficiency by communicating better with industry, public and government. For example, in recent years, ***we have been sharing our inspection manuals with industry operators. This has greatly increased gas plant, rig and pipeline operator understanding of what we expect of them.*** A decrease in the number of unsatisfactory inspections points to the value of this approach.

Who benefits?

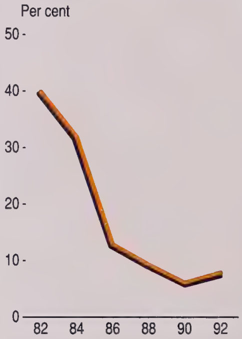
One benefit is that our field staff now have more time to devote to public consultation and public complaints. Indeed, working with landowners and municipalities is now considered as important as facility inspection.

Improved industry compliance with regulations also benefits the public. Examples are reduced incidences of noise and odours, and greater worker and public safety. ■

HORIZONTAL WELLS



DRILLING RIG UNSATISFACTORY INSPECTIONS



ERCB *and* QUALITY MANAGEMENT

Our commitment to continuously improve our service to Albertans caused us to examine ways to identify and implement service improvements more quickly.

In 1991, we adopted an organization-wide program that involved all employees in finding ways to achieve greater efficiency and effectiveness. Compelling factors in this decision included a realization that budget constraints would be a fact of life in the 1990s, along with growing expectations for service and increasing demands on the organization.

By adopting a quality management approach, we are reinforcing our long-standing customer focus. The program includes initiatives ranging from minor improvements to sweeping reviews of the way we deliver our core services.

Focusing on our customers, we now ask ourselves:

"***Do we need this process? If not, let's eliminate it.***"

"***If we need it, how can it be improved?***"

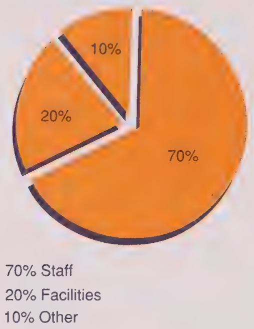
To maximize the effect of quality management methods, we provided training to all staff in the techniques of continuous improvement. We have encouraged our employees to accept the responsibility to find and implement better ways of serving industry, the public and government.

If we determine that something needs review, our training allows our staff to work through a process to achieve the needed improvement. By keeping our focus on meeting customer needs, we can accelerate the implementation of change with greater confidence that the changes are the right ones. ■

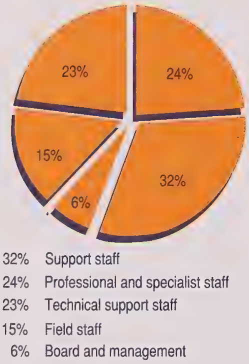
> "The challenge of the 90s for the public sector is to maintain or improve the quality of our service while at the same time dramatically reducing our costs. By utilizing the principles of Total Quality Management, and thereby tapping the combined creativity, innovation and dedication of all of our staff, I believe we can and will meet this challenge. In the process, we will build a public sector in Alberta that will be a source of pride for all Albertans."
>
> *Jack Klinck*
> *Public Trustee*
> *Alberta Attorney General*

MATCHING RESOURCES *to* EXPECTATIONS

DISTRIBUTION OF BUDGET



ERCB ORGANIZATION



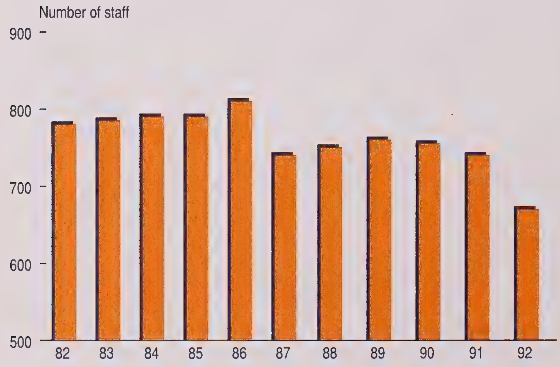
The ERCB is funded in a uniquely balanced manner. Each year, the provincial government sets out its share of the ERCB budget. We then impose a levy on all producing oil and gas wells in the province to collect up to the amount provided by the provincial government. These matching contributions provide approximately 80 per cent of our budget. We also receive revenue from some of the services we provide, which adds the remaining 20 per cent.

About 70 per cent of our expenditures is staff costs. This reflects our emphasis on information and regulation. Maintaining offices, research facilities and computer processing accounts for 20 per cent of expenditures. The remaining 10 per cent covers equipment, supplies and travel.

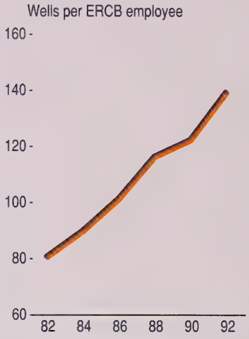
Since 1986, we have reduced our staff by approximately 20 per cent and maintained core services. (Staff reductions have been through early retirement and voluntary severance.)

ERCB staff reductions paralleled those in industry. Contrary to what one might think, less industry activity did not translate into less work for the ERCB. Industry lost many experienced people familiar with our requirements. We have thus been spending more time guiding industry staff who remained. The drop-off in industry activity also coincided with increased public expectations with respect to safety and the environment. Finally, our work is also largely driven by the province's inventory of operating facilities. Although their rate of growth has slowed in recent years, the total number of facilities that require our attention continues to increase. ■

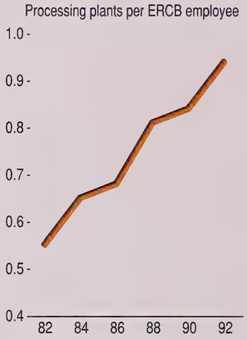
ERCB STAFFING



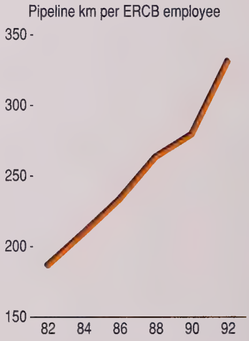
1982 - 1992 ERCB WORKLOAD



1982 - 1992 ERCB WORKLOAD



1982 - 1992 ERCB WORKLOAD



THE ERCB BOTTOM LINE—
the PUBLIC INTEREST

"In 1992, the Canadian International Development Agency and Petro-Canada teamed up to build a small-scale core storage facility in Morocco. The facility was modeled on the ERCB's world-class Core Research Centre.

The advice of the ERCB-loaned adviser was important to the success of the project. The project transferred expertise that met local needs on a modest budget. It was Canadian foreign aid at its best."

Glenn Hughes
Genn Consulting
Calgary

Change has been the main theme of this publication. After more than 50 years of adapting our regulations to changing circumstances, we now find ourselves in one of the most rapid transformations ever to affect Alberta's energy industry, government and public. We hope this publication has provided a better understanding of how we are reacting to meet these major challenges.

If you are in industry or government, we hope you are persuaded about how seriously we take our commitment to streamline our regulatory work. At the same time, we commit to maintaining the quality service that has earned us the respect and confidence of Albertans and regulatory authorities around the world.

If your interest is as a citizen of Alberta, we also hope you have learned more about the ERCB. The next time you hear about an energy-related emergency, you will know that we will be coordinating a response that places the highest priority on public health and safety. Or, if you live in a community about to be the site of a major energy facility, rest assured that you will have a say in the project.

We have also shown that the ERCB is facing an ever-increasing load of regulatory work from suspended, aging and expanding energy facilities. We think Albertans want us, as regulator, to deal reasonably and fairly with this province's maturing industry. People want us to ensure industry's long-term responsibility for such things as the proper abandonment of older facilities that are no longer required.

We also seek your support. If you have benefited from the ERCB directly or indirectly, we would like to hear from you. If you have a concern about how we do things, let us know. If you have suggestions about how we can improve, we would like to know that, too. ■

Write or telephone:
Bill Schnitzler
Continuous Improvement
Coordinator
Energy Resources
Conservation Board
640 Fifth Avenue S.W.
Calgary, Alberta
T2P 3G4
(403) 297-7322

OUR MISSION

To ensure that development of Alberta's energy resources takes place in a responsible manner in the interests of Albertans.

OUR VISION

We provide a regulatory process for ensuring that development of Alberta's energy resources occurs in a safe, efficient and environmentally sound manner that balances the broad interests of Albertans. We are an accessible, effective and respected organization that knows its customers, works with them to jointly solve problems, recognizes their changing needs and serves them in an efficient and timely manner.

OUR CORE VALUES

We are committed to conducting ourselves in ways that are consistent with our vision. This conduct ensures

- respect for the equality and dignity of individuals and their quality of life
- fairness and honesty
- customer satisfaction and confidence
- cooperation
- quality, excellence and continuous improvement in everything we do.

OUR LEGISLATION

The Energy Resources Conservation Act defines the core functions of the Board today. It calls for the Board to

- provide for the appraisal of reserves and productive capacity
- provide for the appraisal of energy resource requirements
- effect the conservation of, and prevent the waste of, Alberta's energy resources
- control pollution and ensure environmental conservation
- secure the observance of safe and efficient practices
- provide for the recording and timely and useful dissemination of information
- provide agencies from which the Government of Alberta may receive information, advice and recommendations.

The Board is also directed, in reviewing any application for a proposed energy resource project, to give consideration to whether the project is in the public interest having regard to its social and economic effects and its effects on the environment.

As always, we welcome your input to this publication.
Please contact:

Simone Marler, Editor
Communications Department
10th Floor, 640 Fifth Avenue S.W.
Calgary, Alberta T2P 3G4
(403) 297-8552

Energy Alberta 1992 is the result of an ERCB team effort. Gabriela Eibenschutz developed and implemented this year's design concept. Graphs were prepared by Barry Wheeler, using statistical research prepared by Colin Bennett. Additional production assistance came from Cheryl Starr Designs.

Photography was by Shane Richardson, with additional photos by David Teh of Paladin Projects International Ltd., Gulf Canada Resources Limited, and Walter Younkin of HBT AGRA Limited.

Departmental contributors were Khalid Jamil, Kevin Johnston, Thorn Walden, Tom Cook, Ivan Weleschuk, Brent Harrison, Brad Hubbard, Mary Anne Cairns, Keith Gladwyn, Al Mayer and Tom Pesta . Jim Dilay was involved in final review.

Summer student Mitchell Smith and design student Brian Huey worked on a reader survey and graphic changes that contributed to a new look for *Energy Alberta 1992.*

Gerry DeSorcy served as Editor for the supplement *Time of Transition: the Energy Resources Conservation Board into the Next Century.* Writing was by Peter Kinnear and Simone Marler, graphs by Barry Wheeler, and layout and design by Gabriela Eibenschutz. The Board appreciates the efforts of many staff who contributed statistics, story ideas and information to compile the supplement.

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Energy Resources
Conservation Board
640 Fifth Avenue S.W.
Calgary, Alta. T2P 3G4

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